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BANEASA S.A.

FULL LINE
CONDENSED CATALOG
1995 - 1996

BANEASA S.A.

GENERAL CONTENTS

GENERAL INFORMATION	PAGE	3
INTEGRATED CIRCUITS	PAGE	7
SILICON DIODES	PAGE	34
SRCs	PAGE	55
SILICON TRANSISTORS	PAGE	71
CAPACITORS	PAGE	85
PRINTED CIRCUIT BOARDS	PAGE	106
POWER BLOCKS	PAGE	109
CONSUMER APPLICATIONS	PAGE	121
VARISTORS	PAGE	130
MISCELLANEOUS	PAGE	131

ELECTRONIC COMPONENTS AND APPLICATIONS

BANEASA S.A.

This FULL LINE CONDENSED CATALOG has been elaborated in BANEASA S.A. - The Technical Department, with the assistance of the specialists listed below.

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BANEASA S.A.

IPRS BANEASA

IPRS BANEASA

IPRS·β

β

This SHORT FORM CATALOG provides the basic information concerning our extensive line of products and applications. Although product information and diagrams are current at the time of printing, BANEASA, striving to offer excellent products at a fair value , reserves the right to change specifications, designs and models without notice.
The data provided in this catalog has been carefully checked up and is believed to be true and reliable. However , no liability is assumed for possible omissions or inaccuracies.
On the customer's request the manufacturer will deliver electronic components tested under specific electrical and mechanical conditions.

F U L L L I N E

C O N D E N S E D

C A T A L O G

1 9 9 5 - 1 9 9 6

SYMBOLS

A = Anode
B = Base
BW = Band Width
C = Collector
C_{is} = Input capacitance (common source)
C_l = Reservoir capacitance
CMRR = Common mode rejection ratio
C_n = Nominal capacitance
C_{ob} = Output capacitance (common base)
C_{og} = Output capacitance (common gate)
C_{rs} = Reverse capacitance (common source)
C_{tot} = Diode capacitance
CV = Capacitance x Voltage product
D = Drain
di/dt = Rise rate of the on-state current
dv/dt = Rise rate of the off-state voltage
E = Emitter
F_{clamp} = clamping force device to heatsink
f = frequency
f_o = Output frequency
f_T = Transition frequency
$f_{(Yfs)}$ = Cut-off frequency (for FET's)
G = Gate
GND = Ground voltage
G_p = Power gain
G_v = Voltage gain
h_{FE} = D.C. current gain
h_{fe} = A.C. current gain

I_B = Base current
I_{BO} = Breakover current
I_C = Collector current
I_{CC} = Supply current per package
I_{CM} = Maximum collector current
I_d = Output mean current
I_{DM} = Maximum off-state current
I_{DSS} = Drain-source saturation current
I_F = Forward continuous current
I_{FAVM} = Maximum mean forward current
I_{FM} = Maximum forward current
I_{FSM} = Surge forward current
I_{GT} = Gate trigger current
I_H = Hold current
I_{IB} = Bias input current
I_{IH} = High-level input current
I_{IL} = Low-level input current
I_{IO} = Offset input current
I_O = Output current
I_{OH} = High-level output current
I_{OL} = Low-level output current
I_{OS} = Short-circuit output current
I_{PP} = Peak-to-peak current
I_R = Continuous reverse current
I_r = Ripple current
I_{RM} = Maximum continuous reverse current
I_{TM} = Maximum on-state current
I_{TAVM} = Maximum mean on-state current
I_{TRM} = Repetitive peak on-state current
I_{TRMS} = RMS on-state current
I_{TSM} = Surge on-state current
I_Z = Zener current
I_{ZM} = Maximum Zener current
I_{ZT} = Test Zener current
i^2t = Current integral

K = Cathode
K_a = Auxiliary Cathode

N = Normal polarity
NC = Non connected terminal
NF = Noise figure

P_d = Power dissipation
P_{RSM} = Peak reverse surge power dissipation
P_{tot} = Total power dissipation

r_F = Slope resistance of a diode
r_f = Dynamic forward resistance
R_L = Load resistance
r_s = Series resistance
R_{thC-A} = Case-ambient thermal resistance
R_{thC-H} = Case-heatsink thermal resistance
R_{thJ-A} = Junction-ambient thermal resistance
R_{thJ-C} = Junction-case thermal resistance
R_{thJ-L} = Junction-lead thermal resistance
r_{ZT} = Zener dynamic series resistance

S = Source
SR = Slew rate

t = time
T_A = Ambient temperature
Tan.d = Tangent of loss angle
T_C = Case temperature
t_d = Delay time
TD_{VIO} = Thermal drift of the offset voltage
t_f = Fall time
THD = Total harmonic distortion
T_J = Junction temperature
T_{JM} = Maximum junction temperature
T_L = Lead temperature
t_{off} = Turn-off time
t_{on} = Turn-on time
t_p = pulse width
t_{pHL} = Propag. delay time high-to-low level output
t_{pLH} = Propag. delay time low-to-high level output
t_q = Circuit commutated turn-off time
t_r = Rise time
t_{rr} = Reverse recovery time
t_s = Storage time
T_{tight} = tightening torque
T_{VJ} = Junction operating temperature

V_{BO} = Breakover voltage
V_{CB0} = Collector-base voltage ($I_E = 0$)
V_{CC} = Supply voltage
V_{CE} = Collector-emitter voltage
V_{CEO} = Collector-emitter voltage ($I_B = 0$)
V_{CER} = Collector-emitter voltage ($R_{BE} \neq 0$)
V_{CES} = Collector-emitter voltage ($V_{BE} = 0$)
V_{CEsat} = Collector-emitter saturation voltage
V_{clamp} = Clamping system allowable voltage
V_{CEX} = Collector-emitter voltage ($V_{BE} \neq 0$)
V_{CO} = Command voltage
V_{DRM} = Repetitive peak forward off-state voltage
V_{DS} = Drain-source resistance
V_F = Continuous forward voltage
V_{FO} = Threshold voltage of a diode
V_{GSoff} = Gate-souce cut-off voltage
V_{GT} = Gate trigger voltage
V_I = Input voltage
V_{IH} = High-level input voltage
V_{IK} = Input clamp voltage
V_{IL} = Low-level input voltage
V_{IO} = Input offset voltage
V_n = Nominal voltage of a capacitor
V_O = Output voltage
V_{OH} = High-level output voltage
V_{OL} = Low-level output voltage
V_{PP} = Peak-to-peak voltage
V_R = Reverse voltage
V_{RA} = Avalanche breakdown voltage
V_{RRM} = Repetitive peak reverse voltage
V_{TM} = Maximum on-state voltage
V_Z = Zener voltage

Y_{fs} = Forward transconductance (common source)

Z = Impedance

1. QUALITY

1.1. THE QUALITY STRATEGY

It is in the Company's Mission Statement that all our products and services shall be efficiently provided in compliance with the highest standard of quality, to meet and anticipate our customers' performance needs. That's why BANEASA S.A. adopted the TOTAL QUALITY CONTROL strategy, meaning that everybody in the company is continuously involved in quality, by preventing and solving the problems at the stage where they arise.

1.2. SCOPE AND QUALITY ORGANIZATION

The quality control department sets quality control and reliability targets for Baneasa's entire product range, defines quality procedures and audits their implementation. The central quality group is also responsible for the evaluation of new products and processes, reliability prediction and reliability studies incoming inspection of the raw materials, delivery inspection and metrology audit.

In addition, seven quality groups are activating in the company's manufacture divisions which principal aim is to enforce high quality reaching.

1.3. QUALITY AND RELIABILITY PROCEDURES

From the stage of development to after sales services , general procedures corresponding to ISO 9002 standard are used. The qualification tests for new products and engineering change, in process quality control, batch acceptance tests and customer services are performed under a consolidate system.

1.4. DELIVERY QUALITY

Lot quality conformance tests are performed through a lot acceptance sampling procedure based on AQL and LTPD plans. The following figures are used in sampling plans:

AQL = 0.1 - 0.25 for functional defects
AQL = 0.4 - 0.65 for parametric defects

The real average outgoing quality of the inspected lots is significant lower than the above mentioned level.

2. PRODUCT DESCRIPTION

This catalog presents the main technical data of the complete product range manufactured by BANEASA S.A. as well as the preliminary data for new items to be produced in the near future.

2.1. GENERAL DESCRIPTION.

Besides the commercial code, other data are also provided : technology type, main applications, use recommendations. The above-mentioned data are more consistent as far as integrated circuits and electronic applications are concerned.

2.2. CONSTRUCTIVE FEATURES.

Outline dimensions are given, together with package type, pin connection, polarity. I.E.C. standardized package drawings are given on every page where necessary.

2.3. ABSOLUTE MAXIMUM RATINGS.

The values included in the "absolute maximum ratings" system cannot be exceeded without taking the risk of component degradation. These values should not be exceeded even under the most unfavorable conditions of operation. It is mandatory to observe simultaneously the above-mentioned limits as no mutual compensation is admitted, the first limit exceeded being imperative.

2.4. ELECTRICAL CHARACTERISTICS.

Information is given under specified working conditions. Depending on their importance in application, the electrical characteristics ca be expressed through :

- limit values (min. and/or max.) guaranteed in the specifications ;
- typical values that render the normal fabrication centering.

For each component family, the catalog indicates a limited number of features that specify briefly and adequately performances essential to the user's orientation.

2.5. CLIMATIC CATEGORY.

This quality index is designed as a three-number sequence standing for the minimum , the maximum storage temperature and number of days of moisture resistance testing. The climatic category is given for capacitors, where more severe limitations concerning the minimum operating temperature have to be met. For semiconductor components the temperature range is much larger and the robustness to long term moisture action can be controlled through the type and thickness of the protective coatings.

3. CODIFICATION , MARKING

3.1. CODIFICATION.

When allocating the commercial codes to the BANEASA S.A. products, the following solutions were adopted, in order of presidency :

- adopting the Pro-Electron, JEDEC international codification system (e.g. the case for transistors);
- maintaining (possible extending) the letter code of reference type, mainly applied to ICs;
- assigning appropriate BANEASA S.A. codes (for the electronic mountings).

3.2. MARKING.

Product marking consists in the following codes:
- β = manufacturer's mark or symbol ;
- commercial code ;
- polarity :
- quality level code

Example : β 2N 3055/3 Q 5093

BANEASA's logo
transistor JEDEC code
h_{FE} range
year 1995
week of fabrication
quality level code (paragraph 4.3.)

4. USE RECOMMENDATIONS

4.1. THERMAL CONSIDERATIONS.

As the junction temperature rises over the maximum admitted value during operation and/or storage and might cause component damage/destruction, the exhaustion of the heat generated at the structure level requires a lot of attention by the equipment designers. Some methods are:

- locating semiconductor components far enough from the heat sources ;
- observing catalog indications in order to maintain at a given temperature certain component subassemblies (connections, packages), which contribute to heat elimination via conduction ;
- using cooling accessories (fans, heaters) with known thermal characteristics for high power components as well as the cooling types indicated in the catalog ;
- using compounds which provide an adequate thermal transfer from the mounting base to the heater.

4.2. MECHANICAL INTEGRITY CONSERVATION.

Component packages , playing a double role of heat elimination and structure protection against the hazard of the environment should not be submitted to strong shocks able to affect their mechanical integrity. It is recommended to avoid traction and torsion stress of leads. Admitted bending for flexible leads is 90°. Lead bending-torsion should not be applied at less than 2.4 mm distance from the package body.

When mounting a component on a heater, one should observe the indications of the component supplier :

- heater and mounting base flatness ;
- minimum and maximum values of the clamping force allowing an accurate thermal transfer without damaging the component or the heater.

These information specific to the component/package/heater are object of the sale contract appendixes.

4.3. CONNECTION.

Components to be connected on a PCB via soldering should be protected against excessive rise of the junction temperature during soldering. All soldering methods are allowed (soldering iron , dip-wave soldering); anyhow , one should take into account the following indications :

Max. soldering temperature	Max.Time	Min. distance from package
260 °C	5 sec.	5 mm

5. DELIVERY CONDITIONS

Components are packed in containers of the type, size and kind commonly used, which ensure acceptance by common carriers and safe delivery at the destination. The following information appears on the label or are directly marked on each container : BANEASA's identification mark, type of the components, quantity, no. of the technical standard , lot number & date code , Q.A. certification stamp and inspector signature.

Quantities to be delivered, delivery time and therms, other additional requirements of the customer (electrical specs, marking, environmental qualification, protective layers, packing) can be established and confirmed at the order issue. For details, please contact our sales department:

BANEASA S.A. - telex 11203 banes r , FAX: +401-633.42.25 , Phone: +401-633.40.50 (central office)

ALPHANUMERIC INDEX

CDB 400E,EM....26
CDB 400HE,HEM...26
CDB 402E,EM....26
CDB 403E,EM....26
CDB 404E,EM....26
CDB 405E,EM....26
CDB 406E,EM....26
CDB 407E,EM....26
CDB 408E,EM....26
CDB 409E,EM....26
CDB 410E,EM....26
CDB 410HE,HEM...26
CDB 411HE,HEM...26
CDB 413E,EM....27
CDB 416E,EM....27
CDB 417E,EM....27
CDB 420E,EM....27
CDB 430E,EM....27
CDB 430HE,HEM...27
CDB 432E,EM....27
CDB 437E,EM....28
CDB 438E,EM....28
CDB 440E,EM....28
CDB 440HE,HEM...28
CDB 442E,EM....28
CDB 446E,EM....28
CDB 447E,EM....28
CDB 450E,EM....28
CDB 451E,EM....28
CDB 451HE,HEM...28
CDB 453E,EM....28
CDB 454E,EM....28
CDB 454HE,HEM...29
CDB 460E,EM....29
CDB 472E,EM....29
CDB 473E,EM....29
CDB 474E,EM....29
CDB 475E,EM....29
CDB 476E,EM....29
CDB 481E,EM....29
CDB 483E,EM....29
CDB 486E,EM....29
CDB 490E,EM....29
CDB 492E,EM....30
CDB 493E,EM....30
CDB 495E,EM....30
CDB 837E,EM....32
CDB 838E,EM....32
CDB 4121E,EM....30
CDB 4123E,EM....30
CDB 4151E,EM....30
CDB 4153E,EM....30
CDB 4157E,EM....31
CDB 4180E,EM....31
CDB 4192E,EM....31
CDB 4193E,EM....31
CDB 8136E.....32
CLB 2711EC.....11
DAC 08C,E,H....18
FZH 101.....33
FZH 105.....33
FZH 111.....33
FZH 115.....33
FZH 121.....33
FZH 125.....33
FZH 131.....33
FZH 135.....33
FZH 141.....33
FZH 145.....33
FZH 171.....33
FZH 175.....33

SAK 215MN,N,VN..18
SAS 560S.....14
SAS 570S.....14
SAS 6804.....14
TAA 661.....14
TBA 120T,U.....14
TBA 315N.....18
TBA 530.....14
TBA 540.....14
TBA 570A.....15
TBA 790T.....12
TBA 810AS,S....12
TBA 820N.....12
TBA 950/1,/2....15
TCA 105N.....18
TCA 150T.....12
TCA 520N.....10
TCA 640.....15
TCA 650.....15
TCA 660.....15
TDA 440N,P.....15
TDA 1028.....12
TDA 1029.....13
TDA 1046.....16
TDA 1085A.....19
TDA 1170S,N,D...16
$TDA 2003.....13
TDA 2006.....13
TDA 2014.....18
TDA 2030.....13
TDA 2581.....19
TDA 2582.....19
$TDA 3540.....16
$TDA 3541.....16
$TDA 4601.....10
$TDA 4605.....10
TDA 5850.....18
TDA 7050N.....13
$TDA 7211.....13
TDA 7220.....16
TDA 8105,N.....16
TEA 1060.....19
TEA 1061.....19
$TL 494.....19
UNICIP 1000.....23
UNICIP 2000.....23
UNICIP 3000.....24
β 340D.....19
β 342D.....19
β 790AT,T.....12
β 5400.....26
β 54H00.....26
β 5402.....26
β 5403.....26
β 5404.....26
β 5405.....26
β 5406.....26
β 5407.....26
β 5408.....26
β 5409.....26
β 5410.....26
β 54H10.....26
β 54H11.....26
β 5413.....27
β 5416.....27
β 5417.....27
β 5420.....27
β 5430.....27
β 54H30.....27
β 5432.....27
β 5437.....28

β 5438.....28
β 5440.....28
β 54H40.....28
β 5442.....28
β 5446.....28
β 5447.....28
β 5450.....28
β 5451.....28
β 54H51.....28
β 5453.....28
β 5454.....28
β 54H54.....29
β 5460.....29
β 5472.....29
β 5473.....29
β 5474.....29
β 5475.....29
β 5476.....29
β 5481.....29
β 5483.....29
β 5486.....29
β 5490.....29
β 5492.....30
β 5493.....30
β 5495.....30
β 54121.....30
β 54123.....30
β 54151.....30
β 54153.....30
β 54157.....31
β 54180.....31
β 54192.....31
β 54193.....31
β 5837.....32
β 5838.....32
β 7400.....26
β 74H00.....26
β 74LS00.....26
β 7402.....26
β 74LS02.....26
β 7403.....26
β 74LS03.....26
β 7404.....26
β 74LS04.....26
β 7405.....26
β 74LS05.....26
β 7406.....26
β 7407.....26
β 7408.....26
β 74LS08.....26
β 7409.....26
β 74LS09.....26
β 7410.....26
β 74H10.....26
β 74LS10.....26
β 74H11.....26
β 74LS11.....26
β 74LS12.....26
β 7413.....27
β 74LS13.....27
β 74LS14.....27
β 74LS15.....27
β 7416.....27
β 7417.....27
β 7420.....27
β 74LS20.....27
β 74LS21.....27
β 74LS22.....27
β 74LS27.....27
β 74LS28.....27
β 7430.....27

β 74H30.....27
β 74LS30.....27
β 7432.....27
β 74LS32.....27
β 74LS33.....28
β 7437.....28
β 74LS37.....28
β 7438.....28
β 74LS38.....28
β 7440.....28
β 74H40.....28
β 74LS40.....28
β 7442.....28
β 7446.....28
β 7447.....28
β 7450.....28
β 7451.....28
β 74H51.....28
β 74LS51.....28
β 7453.....28
β 7454.....28
β 74H54.....29
β 74LS54.....28
β 74LS55.....29
β 7460.....29
β 7472.....29
β 7473.....29
β 7474.....29
β 74LS74.....29
β 7475.....29
β 7476.....29
β 7481.....29
β 7483.....29
β 7486.....29
β 74LS86.....29
β 7490.....29
β 7492.....30
β 7493.....30
β 7495.....30
β 74121.....30
β 74123.....30
β 74LS123.....30
β 74LS125.....30
β 74LS126.....30
β 74LS132.....30
β 74LS136.....30
β 74LS138.....30
β 74151.....30
β 74153.....30
β 74LS153.....30
β 74157.....31
β 74LS157.....31
β 74LS158.....31
β 74LS160.....31
β 74LS161.....31
β 74LS162.....31
β 74LS163.....31
β 74LS174.....31
β 74LS175.....31
β 74180.....31
β 74192.....31
β 74193.....31
β 74LS241.....31
β 74LS253.....31
β 74LS257.....31
β 74LS258.....31
β 74LS266.....31
β 74LS386.....31
β 7837.....32
β 7838.....32
β 78136.....32

βA 723,C.....9
βA 726,X.....20
βA 741,J,M,JN,MN,N...10
βA 758.....17
βA 3054.....20
βA 7805A,AK,C,CK.....9
βA 7806A,AK,C,CK.....9
βA 7808A,AK,C,CK.....9
βA 7809A,AK,C,CK.....9
βA 7812A,AK,C,CK.....9
βA 7815A,AK,C,CK.....9
βA 7818A,AK,C,CK.....9
βA 7824A,AK,C,CK.....9
βAA 145.....20
βE 555MN,N.....20
βE 565.....17
βH 1.....20
βH 2.....20
βL 105.....21
βL 106.....21
βL 107.....21
βL 108.....21
βL 120A.....21
βL 121A.....21
$βL 497B.....21
$βLF 356N.....10
βM 101A,AN.....10
βM 108,A,AN,N.....10
βM 135A.....21
βM 208,A,AN,N.....10
βM 301A,AN.....10
βM 308,A,AN,N.....10
βM 317AH,AK,AT,H,K,T. 9
βM 324.....10
βM 335,A.....21
βM 339.....11
βM 358N.....10
βM 381,A.....13
βM 387AN,N.....13
βM 393N.....11
βM 747C,E.....10
βM 2901.....11
βM 2902.....10
βM 2903N.....11
βM 2904N.....10
βM 3189.....17
βM 3302.....11
βM 3900AE,BE.....10
βMC 1309,A.....17
βML 8204.....21
βML 8205.....21
βS 053.....22
βS 057.....22
βS 255.....22
βSM 231.....22
βSM 232.....22
βSM 233.....22
βSM 234.....22
βT 150N.....12
βT 151N.....12
βU 1001.....23
βU 1002.....23
βU 1003.....23
βU 1004.....23
βU 1005.....23
βU 1010N.....24
βU 1011.....24
βU 1014N.....24
βU 2001.....23
βU 2002.....23
βU 2003.....23

$ Preliminary data

I N T E G R A T E D

C I R C U I T S

Alphanumeric Index _____ page 8

ANALOGUE INTEGRATED CIRCUITS

Voltage Regulators _____ page 9

Op. Amp.s & Comparators _____ page 10

Audio _____ page 12

Radio / TV _____ page 14

Control, Industrial _____ page 18

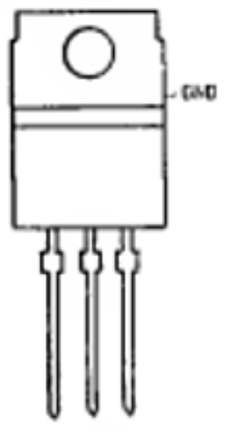
Semi-Custom _____ page 23

DIGITAL INTEGRATED CIRCUITS

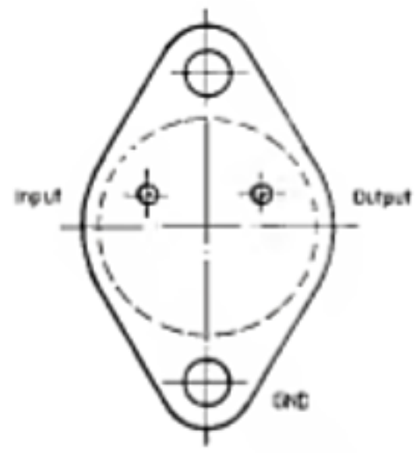
T.T.L. Series _____ page 25

High Level Logic _____ page 33

FIXED VOLTAGE, 3-TERMINAL REGULATORS FOR POSITIVE POWER SUPPLIES



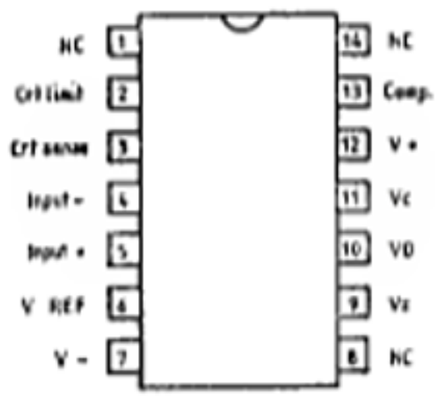
BA 78xxA / BA 78xxC
PACKAGE : TO-220



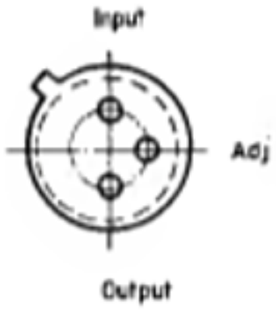
BA 78xxAK / BA 78xxCK
PACKAGE : TO-3

V_O (V)	Tolerance (V)	I_O (mA)	Device Type	V_I (V) Min.	V_I (V) Max.	Reg_{line} (mV)	Reg_{load} (mV)	R_{thJ-C} (°C/W)
5	+/- 0.20	1500	BA 7805A, AK	7.0	35	50	50	4.0
			BA 7805C, CK			100	100	
6	+/- 0.25	1500	BA 7806A, AK	8.0	35	60	60	4.0
			BA 7806C, CK			120	120	
8	+/- 0.30	1500	BA 7808A, AK	10.5	35	80	80	4.0
			BA 7808C, CK			160	160	
9	+/- 0.35	1500	BA 7809A, AK	11.5	35	80	80	4.0
			BA 7809C, CK			160	160	
12	+/- 0.50	1500	BA 7812A, AK	14.5	35	120	120	4.0
			BA 7812C, CK			240	240	
15	+/- 0.60	1500	BA 7815A, AK	17.5	35	150	150	4.0
			BA 7815C, CK			300	300	
18	+/- 0.70	1500	BA 7818A, AK	21.0	35	180	180	4.0
			BA 7818C, CK			360	360	
24	+/- 1.0	1500	BA 7824A, AK	27.0	40	240	240	4.0
			BA 7824C, CK			480	480	

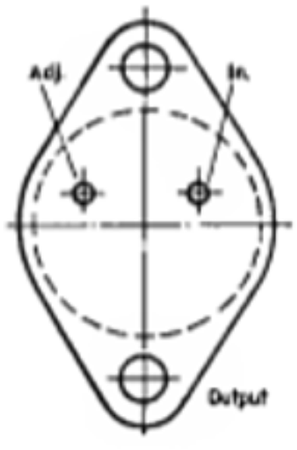
VARIABLE OUTPUT VOLTAGE REGULATORS



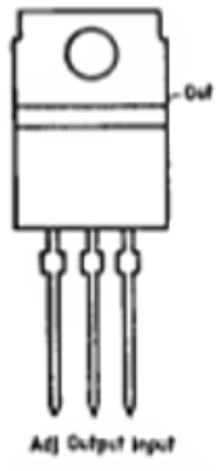
BA 723 / BA 723C
PACKAGE : TO-116



BM 317AH , H
PACKAGE : TO-39



BM 317AK , K
PACKAGE : TO-3



BM 317AT , T
PACKAGE : TO-220

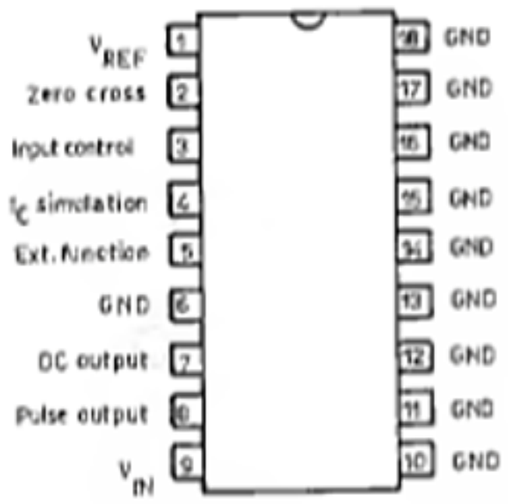
I_O Max. (mA)	Device Type	V_O Min. (V)	V_O Max. (V)	V_I Min. (V)	V_I Max. (V)	V_I-V_O Diff. Min. (V)	V_I-V_O Diff. Max. (V)	P_d Max. (W)	Typ. Regulation % V_O @ T_A = 25 °C Line	Typ. Regulation % V_O @ T_A = 25 °C Load	Temp. Coeff. % V_O @ 0°C< T_J <125°C Typ. (%/°C)	T_J Max. (°C)
150	BA 723	2.0	27	9.5	30	3.0	28	0.5	0.1	0.2	0.003	125
	BA 723C	2.0	37	9.5	40	3.0	38					
500	BM 317AH	1.2	37	5.0	40	3.0	25	*	0.01	0.1	0.006	125
	BM 317H					3.0	40					
1500	BM 317AK , AT	1.2	37	5.0	40	3.0	25	*	0.01	0.1	0.006	125
	BM 317K , T					3.0	40	* Internally limited				

$ SWITCH-MODE POWER SUPPLY CONTROLLER

TDA 4601D

Features :

Operating temperature :	0	70°C
Supply voltage :	7.8	18 V
Switch voltage V9 :	11	12.3 V
Supply current :	110 ...	160 mA
Voltage reference V1 :	4	4.5 V
Feedback voltage V2 :	typ	0.2 V
External protection V5 :	6	8 V



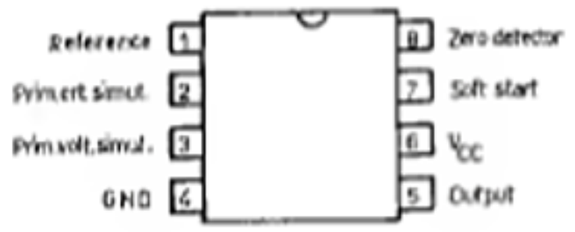
PACKAGE DIL 18 / TOP VIEW

$ CONTROLLER FOR SWITCH-MODE POWER SUPPLY USING MOS-TRANZISTORS

TDA 4605

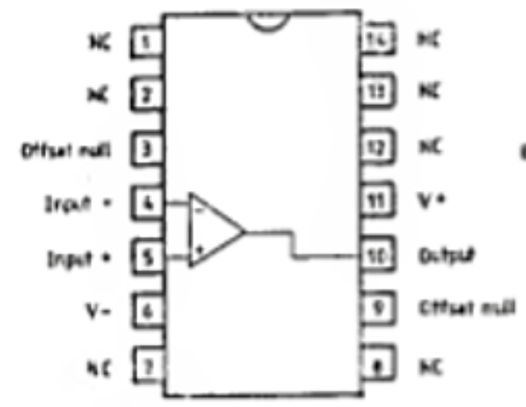
Features :

Operating temperature :	0 ...	70°C
Supply voltage :	8 ...	14 V
Output sourcing saturation I5=-1A		max 3 V
Output sourcing saturation I5=-0.5A		max 1.8 V

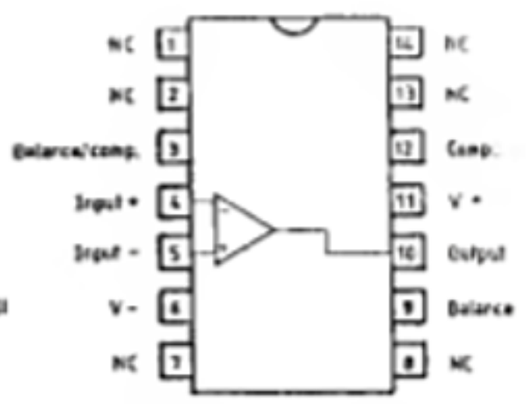


PACKAGE MP-48 / TOP VIEW

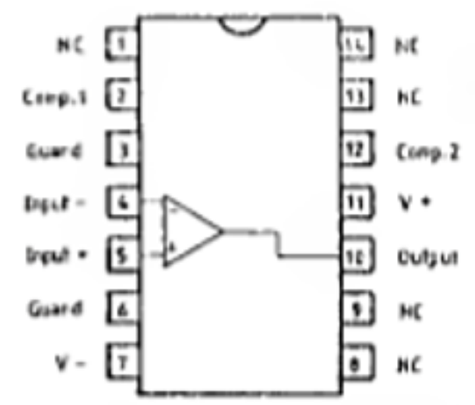
OPERATIONAL AMPLIFIERS



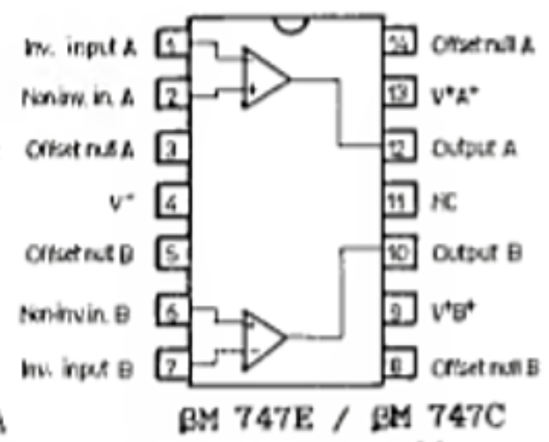
BA 741 / 741J / 741M
PACKAGE : TO-116



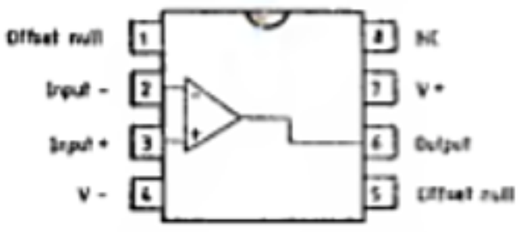
BM 101A / 301A
PACKAGE : TO-116



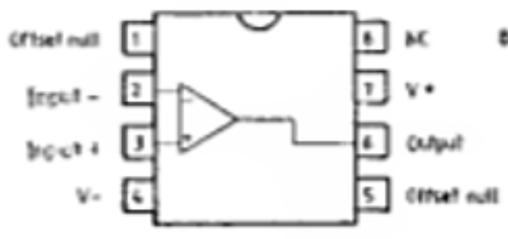
BM 108,A / 208,A / 308,A
PACKAGE : TO-116



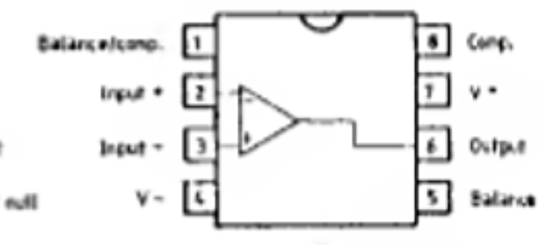
BM 747E / BM 747C
PACKAGE : TO-116



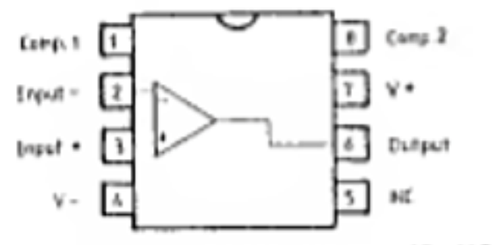
BA 741N, JN, MN
PACKAGE : MP-48



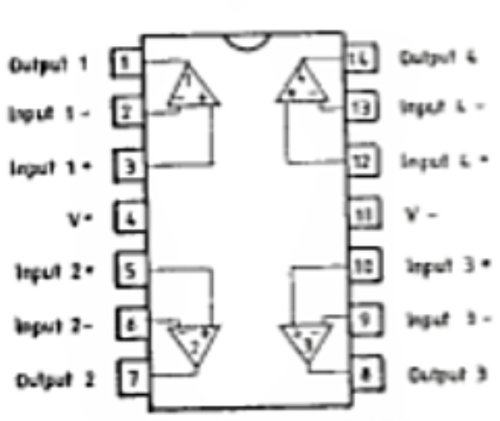
BLF 356N
PACKAGE : MP-48



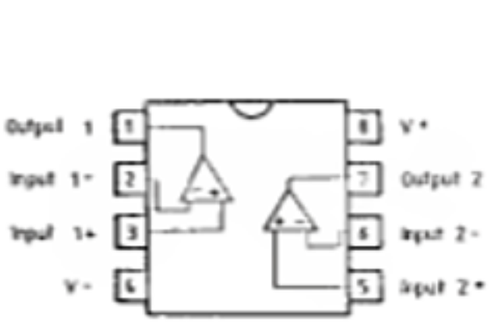
BM 101AN/301AN
PACKAGE : MP-48



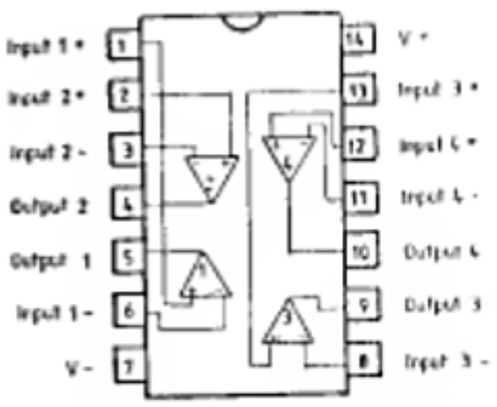
BM 108N, AN/208N, AN/308N, AN
PACKAGE : MP-48



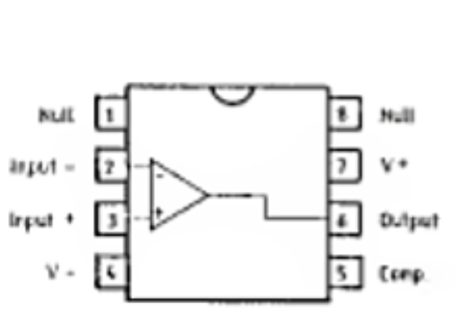
BM 324 / BM 2902
PACKAGE : TO-116



BM 358N / BM 2904N
PACKAGE : MP-48



BM 3900AE / BM 3900BE
PACKAGE : TO-116



TCA 520N
PACKAGE : MP-48

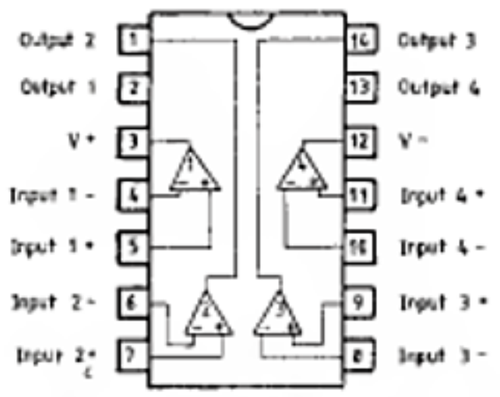
Device	I_{IB} Max. (nA)	V_{IO} Max. (mV)	TD_{VIO} Typ. uV/°C	I_{IO} Max. (nA)	G_V Min. (V/V)	BW # Typ. (MHz)	SR # Typ. (V/us)	CMRR Typ. (dB)	Supply Voltage Min. (V)	Supply Voltage Max. (V)	Description	Nr. of Channels
# G_V=1												
Military Temperature Range (-55°C ... +125°C)												
βA 741M,MN	500	6	15	200	50k	1.0	0.5	90	+/-15	+/-22	General Purpose	
βM 101A,AN	75	2	3.0	10	50k	1.0	0.5	90	+/-3	+/-22	General Purpose	Single
βM 108,N	2	2	3.0	0.2	50k	1.0	0.3	96	+/-2	+/-20	Precision	
βM 108A,AN		0.5	1.0		80k			110				
Industrial Temperature Range (-25°C ... +85°C)												
βM 208,N	2	2	3.0	0.2	50k	1.0	0.3	96	+/-2	+/-20	Precision	Single
βM 208A,AN		0.5	1.0		80k			110				
Commercial Temperature Range (0°C ... +70°C)												
βA 741,N	500	5	15	200	50k	1.0	0.5	90	+/-15	+/-22	General Purpose	Single
βA 741J,JN	200	3		50								
$ βLF 356N	0.2	10	5.0	50pA	50k	2.0	12		+/-5	+/-18	FET Input	
βM 301A,AN	250	7.5	6.0	50	25k	1.0	0.5	96	+/-3	+/-18	General Purpose	Single
βM 308,N	7	7.5	6.0	1.0	25k	1.0	0.3	96	+/-2	+/-18	Precision	
βM 308A,AN		0.5	2.0		80k			110				
βM 324	250	7	7	50	25k	1.0	0.6	>65	+/-1.5	+/-16	Low Power	Quad
βM 358N								70				Dual
βM 747E	80	3	10		25k	1.0	0.5	>80	+/-3	+/-18	βA 741 type	Dual
βM 747C	500	6	10	200	25k	1.0	0.5	>70				
βM 2902	250	7	7	50	25k	1.0	0.6	>50	+/-1.5	+/-13	βM 324 type	Quad
βM 2904N								70			βM 358N type	Dual
βM 3900AE	200				1200	2.5	0.5	SVRR:	4	36	NORTON Inputs	Quad
βM 3900BE								70		18		
TCA 520N	150	6	5.0	30	25k		50 *	90	+/-1	+/-11	Low power	Single

* Open Loop test

QUAD VOLTAGE COMPARATORS WITH OPEN COLLECTOR OUTPUTS

βM 339
βM 2901
βM 3302

Features :	βM 339	βM 2901	βM 3302
Supply Voltage :	2...36 V	2...36 V	2...28 V
Diff. input voltage :	max.36 V	36 V	28 V
Input voltage :	-0.3/36V	-0.3/36V	-0.3/28V
Input offset voltage:	max. ±5mV	±7 mV	±20 mV
Supply current :		max.	2 mA
Operating temperature :		0 ...	+70°C
Open collector outputs			

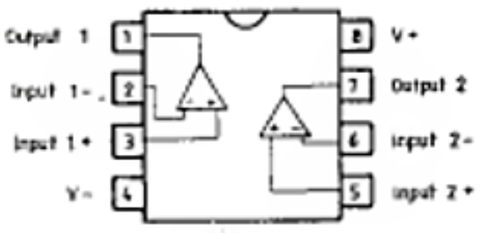


PACKAGE TO-116 / TOP VIEW

DUAL VOLTAGE COMPARATORS WITH OPEN COLLECTOR OUTPUTS

βM 393N
βM 2903N

Features :	βM 393N	βM 2903N
Supply Voltage :	2 .... 36 V	2 .... 28 V
Diff. input voltage :	max. 36 V	max. 28 V
Input voltage :	-0.3 / 36 V	-0.3 / 28 V
Input offset voltage : ...	max. ±5 mV	max. ±7 mV
Input bias current :		max. 250 nA
Input offset current :		max. 50 nA
Supply current :		max. 2 mA
Operating temperature :		0 ... +70°C

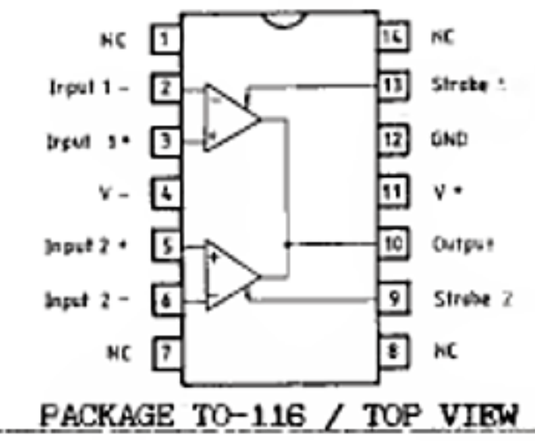


PACKAGE MP-48 / TOP VIEW

HIGH-SPEED VOLTAGE COMPARATOR PAIR WITH COMMON OUTPUT

CLB2711EC

Features :		
Operating temperature	0 ...	+70°C
Positive supply voltage	max.	+14 V
Negative supply voltage	max.	- 7 V
Differential input voltage	max.	± 5 V
Input voltage	max.	± 7 V
Input offset voltage	max.	5 mV
Input bias current	max.	75 uA
Response time	typ.	40 ns



PACKAGE TO-116 / TOP VIEW

BANEASA S.A.

AUDIO POWER AMPLIFIERS , 1.3W ... 2.5W

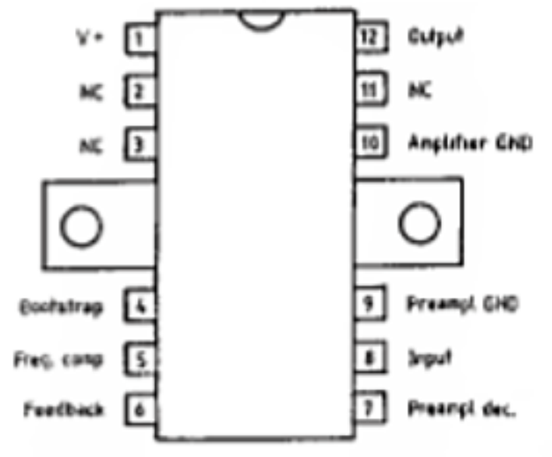
TBA 790T

β 790AT

β 790T

Features :

Operating temperature :			-25...+70°C
Supply voltage :			6 .... 14 V
Input voltage :			-0.5 ...9 V
Voltage gain :			43 ...49 dB
Repetitive peak output current :		max.	1.5 A
Output power (THD=10%) :	TBA 790T	min.	2.5 W
	β 790AT	min.	1.7 W
	β 790T	min.	1.3 W



PACKAGE CB-155 / TOP VIEW

7W AUDIO POWER AMPLIFIERS

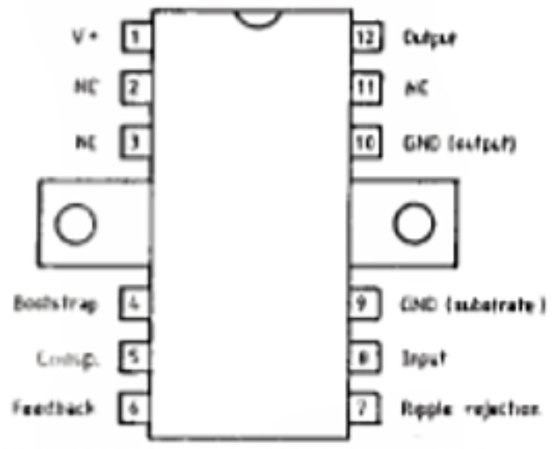
TBA 810AS

TBA 810S

Features :

	TBA 810AS	TBA 810S
Package (same pin config.) :	CB-155	CB-109
Thermal data : $R_{thJ-TABS}$	max. 10 °C/W	12 °C/W
R_{thJ-A}	max. 80 °C/W	70 °C/W

Operating temperature :		-25...+70°C
Supply voltage :		4 .... 20 V
Voltage gain (closed loop) :		34 ...40 dB
Repetitive peak output current :		max. 2.5 A
Output power (@ 16V , 4 ohms)		typ. 7 W



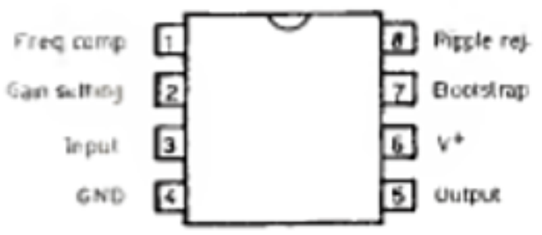
TBA 810AS / PACKAGE CB-155

MINIDIP AUDIO AMPLIFIER

TBA 820N

Features:

Operating temperature :		-25...+70°C
Supply voltage :		3 .... 16 V
Frequency response (-3dB , R_L=8 ohms) :		25/20000 Hz
Voltage gain (open loop , R_L=8 ohms) :		typ. 75 dB
Repetitive peak output current :		max. 1.5 A
Output power (THD=10%) @ 12V , 8 ohms :		typ. 2 W
@ 9V , 8 ohms :		typ. 1.2 W



PACKAGE MP-48 / TOP VIEW

AUDIO POWER AMPLIFIERS , 1W ... 5W

TCA 150T

βT 150N

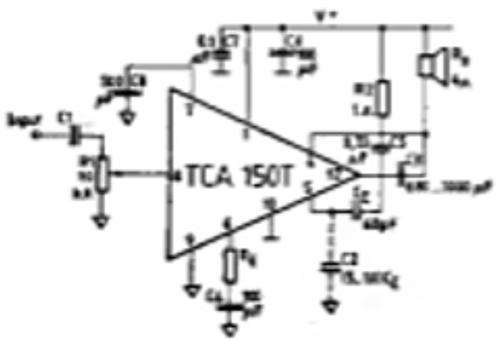
βT 151N

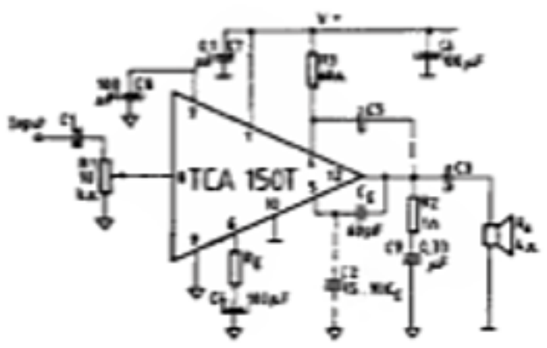
Features :

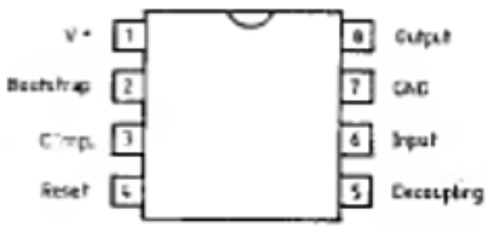
Operating temperature :			-25...+70°C
Supply voltage :			6 .... 18 V
Input voltage :			-0.5 / 15 V
Voltage gain :			43 ...49 dB
Repetitive peak output current :		max.	2.3 A
Output power (THD=10%)	TCA 150T	min.	5 W
	βT 150N, βT 151N	min.	1 W
Thermal res. R_{thJ-A}	TCA 150T	max.	80°C/W
	βT 150N, βT 151N	max.	250°C/W

TCA 150T

PACKAGE CB-155 / TOP VIEW







βT 150N , βT 151N

PACKAGE MP-48 / TOP VIEW

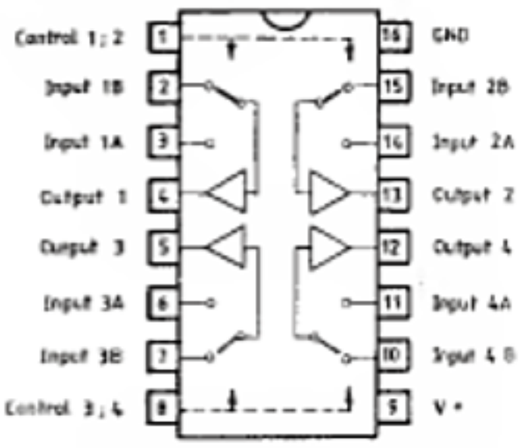
TYPICAL APPLICATIONS

4-CHANNELS / 2-INPUTS SIGNAL SOURCES SWITCHES

TDA 1028

Features :

Operating temperature :		-25...+70°C
Supply voltage :	max.	23 V
Supply current (V=20V) :	typ.	2.5 mA
Input voltage range :	3	19 V
Input bias current :	typ.	250 nA
Voltage gain of the amplifier :	typ.	1 -
Output current :	min.	5 mA
Frequency limit of the output voltage :	typ.	1.3MHz



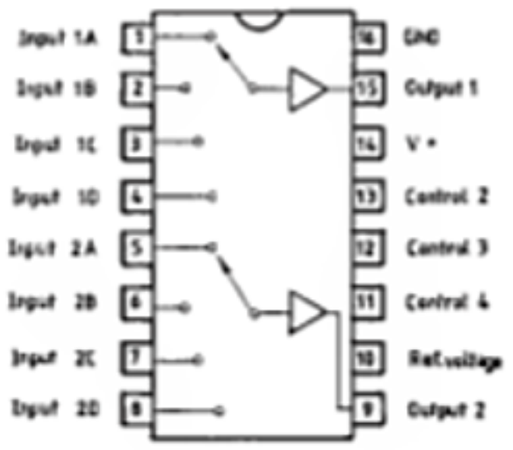
PACKAGE MP-117 / TOP VIEW

2-CHANNELS / 4-INPUTS SIGNAL SOURCES SWITCHES

TDA 1029

Features :

Operating temperature :		-25...+70°C
Supply voltage :	max.	23 V
Supply current (V=20V) :	typ.	4 mA
Input voltage range :	3	19 V
Input bias current :	typ.	250 nA
Voltage gain of the amplifier :	typ.	1 -
Output current :	min.	5 mA
Frequency limit of the output voltage :	typ.	1.3MHz



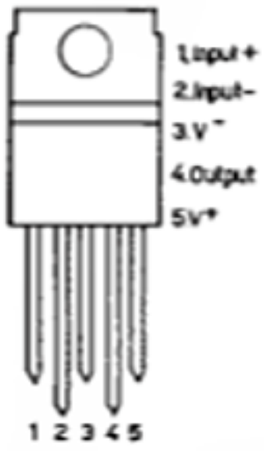
PACKAGE MP-117 / TOP VIEW

$ 10W CAR AUDIO POWER AMPLIFIER

TDA 2003

Features :

Operating temperature :		-25...+70°C
Supply voltage :	8 ...	28 V
Quiescent drain current :	max.	50 mA
Output peak current (repetitive) :	max.	3.5 A
Output peak current non-repetitive) :	max.	4.5 A
Output power V=14.4V, d=10%, R_L=4 ohms	typ.	6 W
R_L=3.2ohms	typ.	7.5 W
R_L=2 ohms	typ.	10 W



PACKAGE PENTAWATT

AUDIO POWER AMPLIFIERS

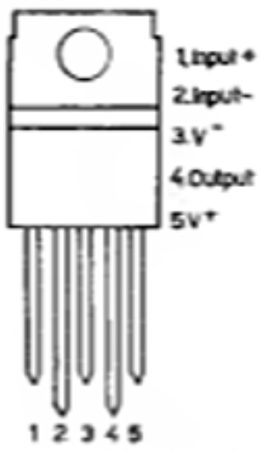
TDA 2006

TDA 2030

Features :

	TDA 2006	TDA 2030
Operating temperature :	-25..+70°C	-25...+70°C
Supply voltage , V+ :	max. ±15 V	max. ±18 V
Quiescent drain current :	max. 80 mA	max. 40 mA
Input voltage :	max. V+	max. ±18 V
Differential input voltage :	max. ±12 V	max. ±15 V
Output power (*) R_L=4 ohms :	typ. 12 W	typ. 14 W
R_L=4 ohms :		min. 12 W
R_L=8 ohms :	min. 6 W	min. 8 W

(*) Test conditions: TDA 2006: V=+/-12V, d=10% ; TDA 2030: V=+/-14V, d=0.5%



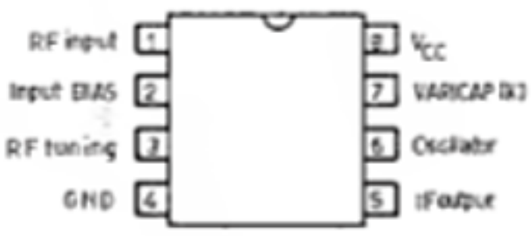
PACKAGE PENTAWATT

$ LOW VOLTAGE FM FRONT-END

TDA 7211A

Features:

Operating temperature :		0...+70°C
Supply voltage :	1.3	6 V
Local oscillator voltage :	max.	330 mV_{rms}
Supply current V_{CC}=3 V :		max 4,5 mA
Convertion gain ,f=98MHz :	typ.	34 dB



PACKAGE MP-48 / TOP VIEW

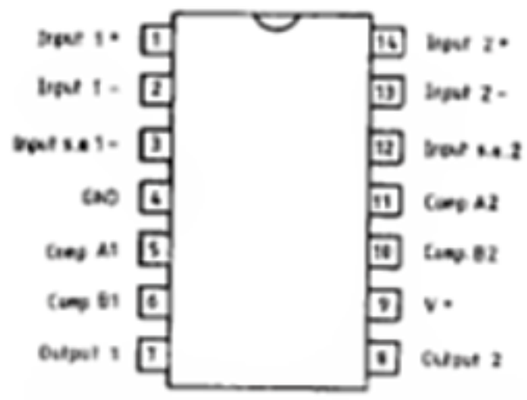
LOW NOISE DUAL PREAMPLIFIERS

BM 381

BM 381A

Features :

Operating temperature :		-25...+70°C
Supply voltage :	9	40 V
Supply current (V=9...40V) :	typ.	10 mA
Voltage gain (differential input) : ...	typ.	160000
Voltage gain (single ended) :	typ.	320000
Unity gain bandwidth :	typ.	15 MHz
Total equiv. RMS noise input : BM 381A	max.	0.7 uV
BM 381	max.	1.0 uV



PACKAGE TO-116 / TOP VIEW

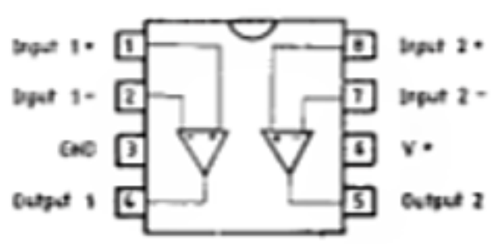
LOW NOISE DUAL PREAMPLIFIERS

BM 387AN

BM 387N

Features :

Operating temperature :		-25...+70°C
Supply voltage :	BM 387AN 9	40 V
	BM 387N 9	30 V
Supply current :	typ.	10 mA
Voltage gain (open loop) :	typ.	160000
Unity gain bandwidth :	typ.	15 MHz
Total equiv. RMS noise input : BM 387AN	max.	0.9 uV
BM 381N	max.	1.2 uV



PACKAGE MP-48 / TOP VIEW

BANEASA S.A.

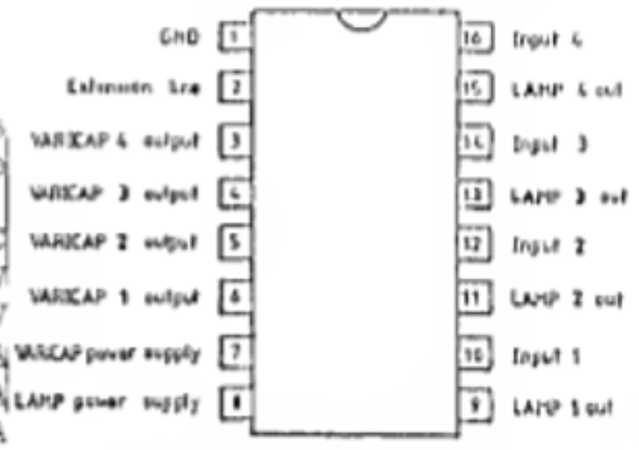
1-OF-4 CHANNELS , EXPANDABLE TOUCH SELECTORS

SAS 560S

SAS 570S

Features : Extended selectors with 8 or more cells can be provided using one SAS 560S and one or more SAS 570S ICs, having pins no.2 connected together.

Operating temperature :	-25...+70	°C
VARICAP supply voltage (pin 7) :	11 ... 35	V
LAMP supply voltage (pin 8) :	5 25	V
Input sensitivity ("touch" current) :	max. 300	nA
LAMP output current :	max. 55	mA
VARICAP output current :	max. 1.5	mA



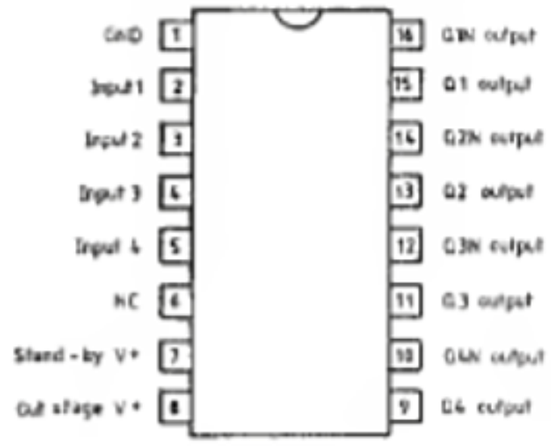
PACKAGE MP-117 / TOP VIEW

4 INDEPENDENT CHANNELS TOUCH SELECTOR

SAS 6804

Features : Each channel includes a T flip-flop with POWER-ON reset and two complem. outputs.

Operating temperature :	-25...+70	°C
STAND-BY supply voltage (pin 7) :	5 18	V
DRIVERS supply voltage (pin 8) :	10 ... 30	V
STAND-BY supply current (V_7=12V) :	typ. 13	mA
Input sensitivity ("touch" current) :	max. 400	nA
Output saturation voltage (I_O=30mA) :	max. 2.4	V
Output leackage current (V_O=0V) :	max. 50	uA



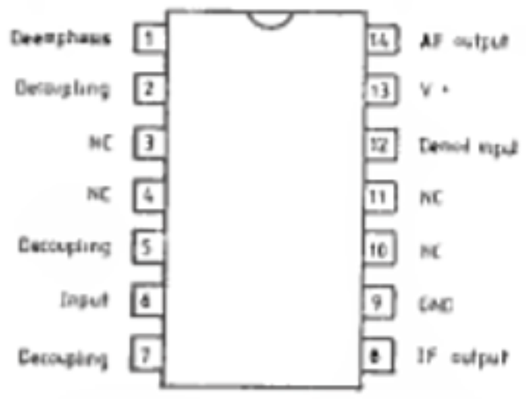
PACKAGE MP-117 / TOP VIEW

IF AMPLIFIER LIMITER AND FM DETECTOR

TAA 661

Features :

Operating temperature :	0 ... +70	°C
Supply voltage :	6 15	V
Supply current (V=12V) :	max. 30	mA
AF output voltage (v_i=10mV) :	min. 700	mV
Input threshold RMS voltage (-3dB) :	max. 250	uV
AM rejection (v_i=10mV; m=30%) :	max. 40	dB
Total harmonic distorsion (v_i=10mV) :	max. 2	%
Output resistance :	typ. 0.1	ko



PACKAGE TO-116 / TOP VIEW

IF AMPLIFIER AND FM DETECTORS

TBA 120T

TBA 120U

Features : TBA 120T uses ceramic filters , while TBA 120U is made for inductive tuning.

Operating temperature :	-25...+70	°C
Supply voltage :	max. 18	V
Supply current (V=12V) :	9 ... 18	mA
Operating frequency range :	0 .. 12	MHz
Volume control :	min. 70	dB
AM rejection :	min. 50	dB
Sensitivity (-3dB) :	max. 60	uV_{ef}

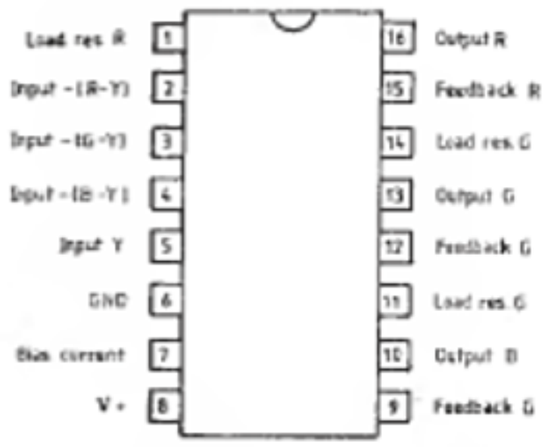
PACKAGE TO-116 / TOP VIEW

RGB MATRIX PREAMPLIFIER FOR COLOUR TV

TBA 530

Features :

Operating temperature :	-25...+70	°C
Supply voltage :	max. 13.2	V
Supply current (V=12V) :	typ. 30	mA
Bias current (pin 7) :	typ. 2.5	mA
Current through load resistance :	max. 10	mA
Output current :	max. 50	mA
Gain ratio lumin./colour amp. (f=500kHz)	30 ...110	%
Luminance/colour bandwidth (f=6MHz) :	typ. -3	dB



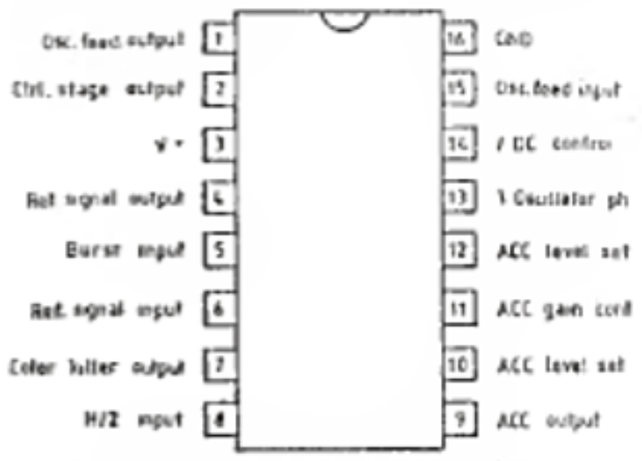
PACKAGE MP-117 / TOP VIEW

PAL REFERENCE COMBINATION FOR COLOUR TV

TBA 540

Features :

Operating temperature :	-25...+70	°C
Supply voltage :	max. 13.2	V
Supply current (V=12V) :	typ. 33	mA
R-Y reference voltage :	typ. 1.5	V_{pp}
Colour killer voltage (colour ON) :	typ. 12	V
Colour killer voltage (colour OFF) :	max. 250	mV
Voltage gain G_{15-1} :	typ. 4.7	-
Voltage gain G_{15-2} (pins 13/14 shorted)	typ. 1.3	-



PACKAGE MP-117 / TOP VIEW

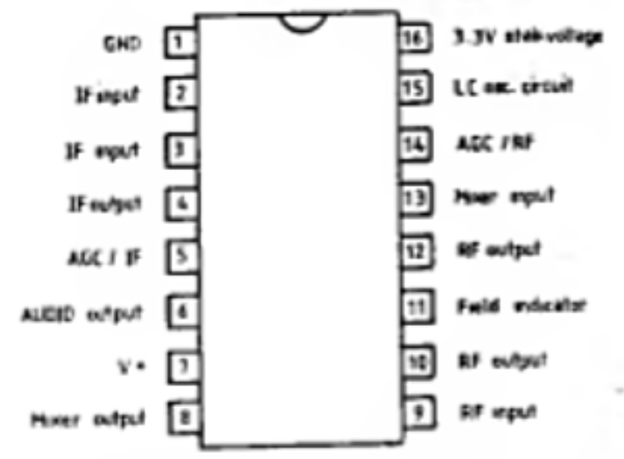
BANEASA S.A.

HI-FI AM RADIO DEMODULATOR AMPLIFIER

TDA 1046

Features :

Operating temperature :		-25...+70°C
Supply voltage :	max.	18 V
Supply current (V=10V) :		15 ...25 mA
HF signal frequency :		0 ...30 MHz
IF signal frequency :		0.2 / 1 MHz
RF amplifier AGC range :	min.	40 dB
Output harmonic distorsions (m=30%) :	max.	0.6 %
Noise to signal ratio (m=0...30%) :	typ.	53 dB



PACKAGE MP-117 / TOP VIEW

TV VERTICAL DEFLECTION SYSTEM

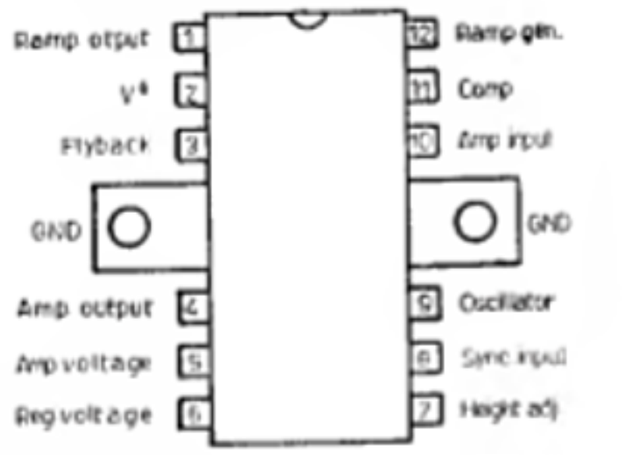
TDA 1170S

TDA 1170N

TDA 1170D

Features (Preliminary Data) :

Operating temperature :		-25...+70°C
Supply voltage (pin 2) :		10 ... 36 V
Flyback peak voltage (pins 4, 5) :	max.	60 V
Power amplifier input voltage :		-0.5 /+10 V
Output peak current at f=50Hz, t≤10us :	max.	2.5 A
RF amplifier AGC range :	min.	40 dB
Ramp generator non-linearity :	max.	1 %
Power dissipation at T_{amb}=90°C :	max.	5 W



PACKAGE CB-109 / TOP VIEW

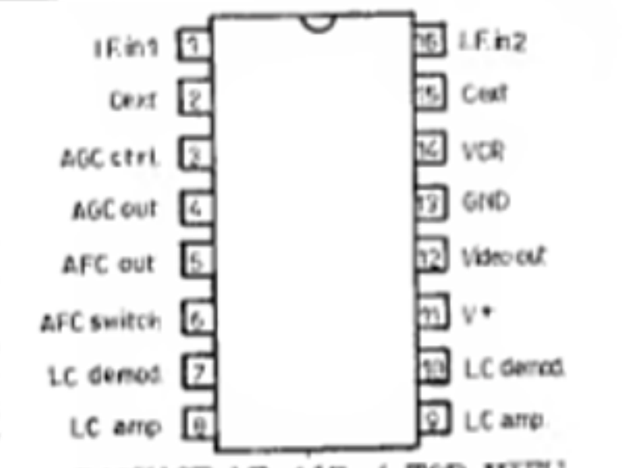
TELEVISION I.F. AMPLIFIER AND DEMODULATORS

$TDA 3540

$TDA 3541

Features : TDA 3540 drives NPN type tuners , while TDA 3541 is used for PNP-based tuners.

Operating temperature :		-25...+70°C
Supply voltage :	typ.	12 V
I.F. input sensitivity (r.m.s. value) :	typ.	70 uV
Video output (white at 10% of top sync)	typ.	2.7 V_{PP}
I.F. voltage gain control range :	typ.	65 dB
Signal-to-noise ratio at V_i=10mV :	typ.	57 dB
A.F.C. output voltage swing (/\f=70kHz)	typ.	10 V



PACKAGE MP-117 / TOP VIEW

LOW VOLTAGE AM-FM RADIO RECEIVER

TDA 7220

Features (Preliminary data) :

High sensitivity and low noise
Simple DC switching AM / FM
AM frequency up to 30 MHz
Very low tweet

Operating temperature :		-25 / +85°C
Storage and junction temperature :		-55 /+150°C
Total power dissipation at T_{amb} :	max.	400 mW
Operating supply voltage :		1.5 / 6.5 V

PACKAGE MP-117 / TOP VIEW

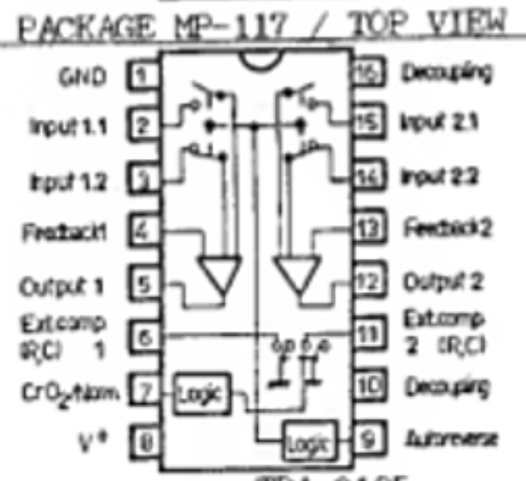
STEREO LOW-VOLTAGE CASSETTE PREAMPLIFIERS

TDA 8105

TDA 8105N

Features :

Operating temperature :		-25...+70°C
Supply voltage :		1.8 ... 6 V
Supply current :	typ.	1.1 mA
Voltage gain (closed loop) :	typ.	40 dB
Total equivalent RMS noise input :	typ.	1.5 uV



TDA 8105
PACKAGE MP-117 / TOP VIEW

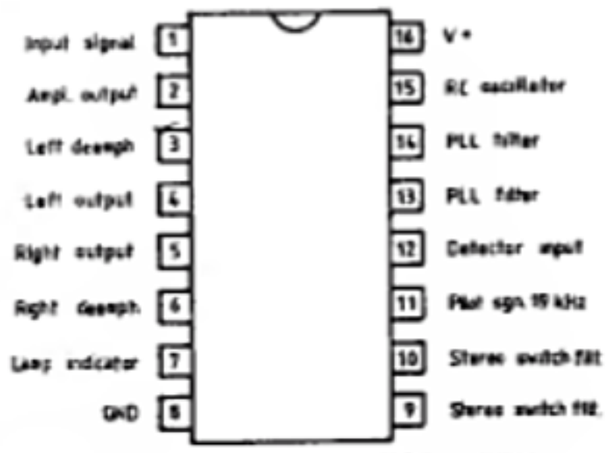
TDA 8105N
PACKAGE MP-48 / TOP VIEW

FM STEREO DECODER

βA 758

Features :

Operating temperature :	0 ...	+70°C
Supply voltage :	max.	16 V
Supply current (V=12V, Lamp OFF) :	max.	35 mA
Channel separation :	min.	30 dB
Channel balance :	max.	1.5 dB
Total harmonic distorsion :	typ.	0.4 %
Capture range :	2 ...	6 $\%f_0$
38 kHz and 19 kHz rejection ratio : ...	min.	20 dB



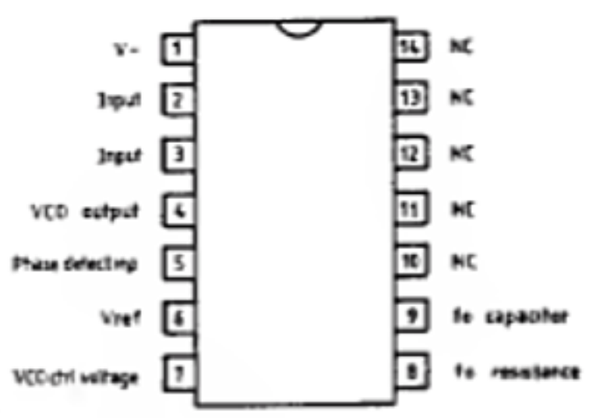
PACKAGE MP-117 / TOP VIEW

PHASE LOCKED LOOP CIRCUIT

βE 565

Features :

Operating temperature :	0 ...	+70°C
Supply voltage :	max.	±12 V
Supply current (V=±6V) :	max.	12.5mA
Triangle wave output voltage (fo=10kHz)	min.	2 V_{PP}
Square wave output voltage (fo=10kHz) :	min.	4.7V_{PP}
VCO operating frequency (Co=2.7pF) : ..	0...500	kHz
VCO output impedance :	typ.	5 ko
Demodulated output voltage (fo=10±1kHz)	min.	200mV_{PP}



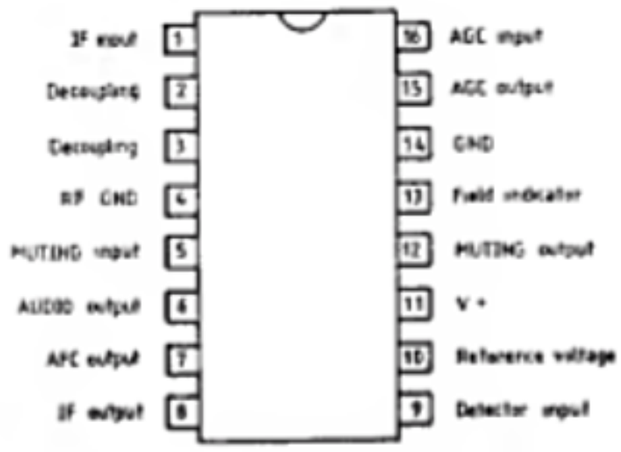
PACKAGE TO-116 / TOP VIEW

HI-FI FM IF RADIO SYSTEM

βM 3189

Features :

Operating temperature :	-25 /	+70°C
Supply voltage :	9	16 V
Supply current (V=12V) :	20 ...	44 mA
Input limiting voltage (-3dB point) :	max.	25 uV
Recovered AF voltage (RMS) :	325/625	mV_{ef}
Single tuned THD :	max.	1 %
Double tuned THD :	typ.	0.1 %
Signal plus noise-to-noise ratio :	min.	65 dB



PACKAGE MP-117 / TOP VIEW

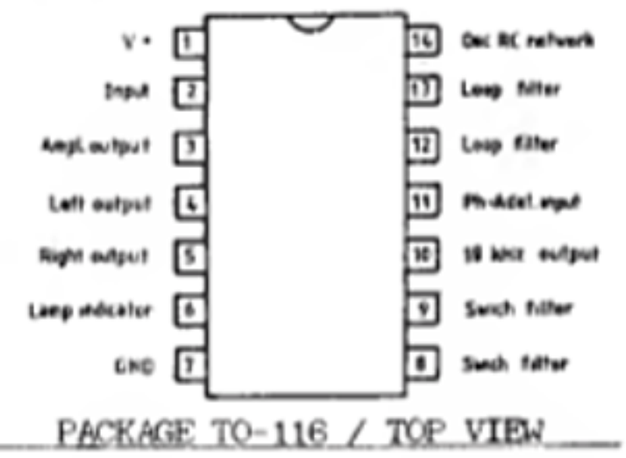
BATTERY SUPPLIED STEREO DECODERS

βMC 1309

βMC 1309A

Features :

Operating temperature :	-25 /	+70°C
Storage temperature :	-25 /	+125°C
Supply voltage βMC 1309A :	4.5 ...	16 V
βMC 1309 :	6	16 V
Channel balance :	max.	1 dB
Mono-aural gain :	typ.	0.9 dB
Channel separation :	typ.	40 dB
Capture range :	min.	±7 %



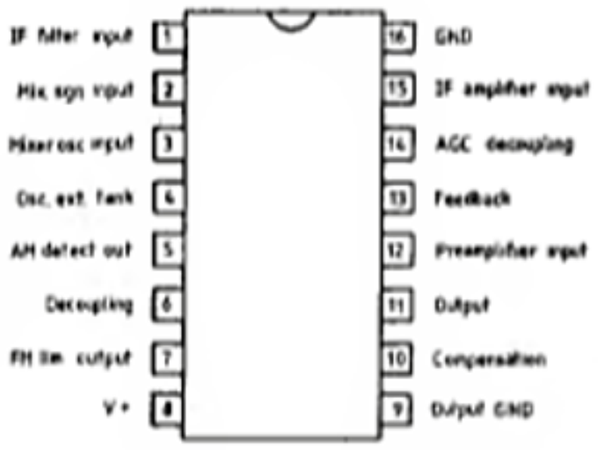
PACKAGE TO-116 / TOP VIEW

AM-FM RADIO RECEIVER

TBA 570A

Features :

Operating temperature :		-25...+70°C
Supply voltage :		3 .... 18 V
Supply current (V=5.3V , unloaded IC) :	max.	15 mA
AM signal to noise ratio (v_{in}=36uV) :	min.	26 dB
FM signal to noise ratio (v_{in}=5mV) :	min.	55 dB
AM AGC range :	min.	60 dB
Output voltage (AM, v_{in}=100uV, m=30%) :	min.	20 mV
FM IF sensitivity :	min.	140 uV



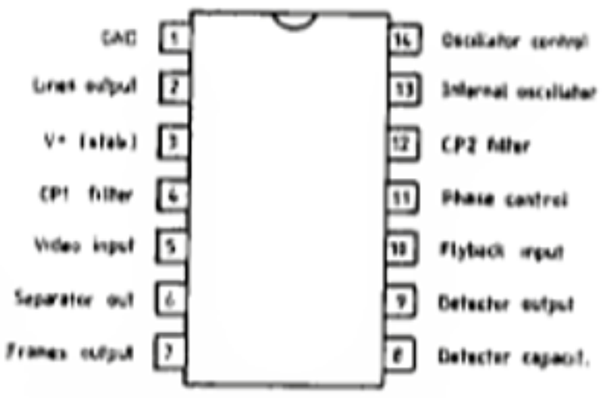
PACKAGE MP-117 / TOP VIEW

TV SIGNAL PROCESSING CIRCUITS

TBA 950/1
TBA 950/2

Features :

Operating temperature :		0 ... +60°C
Supply voltage (through ext. resistor):		12 ... 18 V
Stabilised voltage (pin 3 , I=40mA) :		8.9 /10.5 V
Compcsite video signal amplitude :		1 ... 6 V_{PP}
Free frequency cscilation :		15.625 kHz
Frecquency pull-in range :		min. ±500Hz
Output pulse duration : TBA 950/1		22 / 26 uS
TBA 950/2		24 /28.5 uS



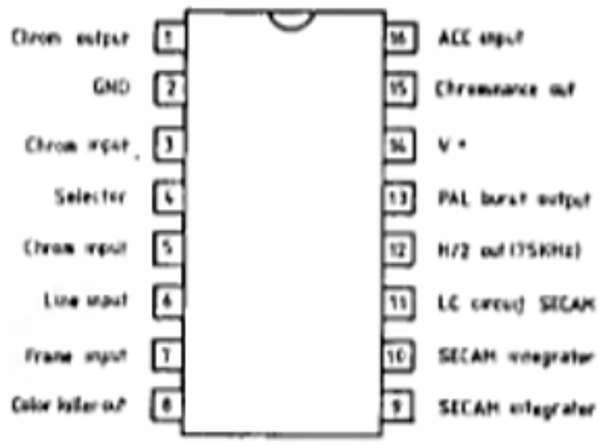
PACKAGE TO-116 / TOP VIEW

CHROMINANCE AMPLIFIER FOR PAL/SECAM DECODERS

TCA 640

Features :

Operating temperature :		-25...+70°C
Supply voltage :		max. 13.2 V
Supply current (V=12V) :		typ. 37 mA
Chrominance output signal (PAL mode) :		425/575mV_{PP}
Chrominance output signal (SECAM mode):		1.8/2.3 V_{PP}
Burst output (PAL mode) :		typ. 1 V_{PP}
Burst rejection :		min. 40 dB
Square-wave output voltage :		2.5/3.5 V_{pp}



PACKAGE MP-117 / TOP VIEW

CHROMINANCE DEMODULATOR FOR PAL/SECAM DECODERS

TCA 650

Features :

Operating temperature :		-25...+70°C
Supply voltage :		max. 13.2 V
Supply current (V=12V) :		typ. 36 mA
R-Y chrominance gain (PAL mode) :		typ. 2.8 -
B-Y chrominance gain (PAL mode) :		typ. 3.1 -
Gain difference from line to line : ...		max. 5 %
Output signals amplitude DR, DB (SECAM)	1.6	2.2 V
Square-wave input signal :		2.55/3.55V_{PP}

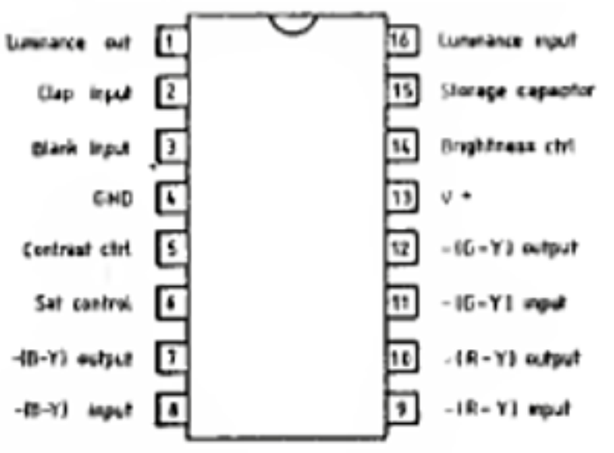
PACKAGE MP-117 / TOP VIEW

CONTRAST, SATURATION & BRIGHTNESS CONTROL CIRCUIT

TCA 660

Features:

Operating temperature :		-25...+70°C
Supply voltage :		max. 13.2 V
Supply current (V=12V) :		typ. 25 mA
Black level volt. at brightness setting		2.2 / 5.2 V
Bandwidth of luminance signal (f=6MHz):		min. -3 dB
(R-Y) output signal :		typ.1.25V_{PP}
(B-Y) output signal :		typ.1.60V_{PP}
(Y) luminance output signal :		typ. 3 V_{PP}



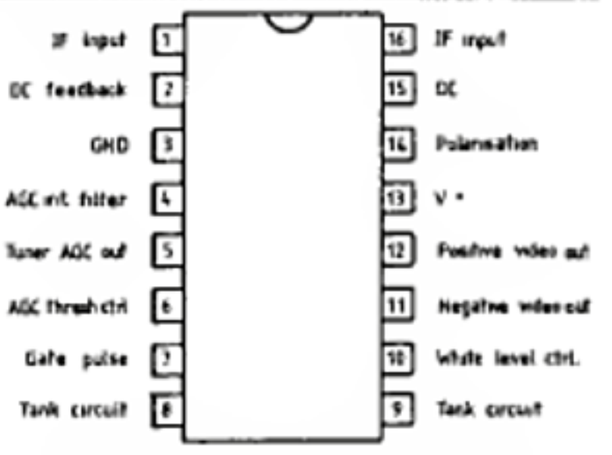
PACKAGE MP-117 / TOP VIEW

TV VIDEO SIGNAL IF AMPLIFIER

TDA 440N
TDA 440P

Features : TDA 440N drives NPN type RF amplifiers, while TDA 440P is used for PNP RF amps.

Operating temperature :		-25...+70°C
Supply voltage :		10 ... 15 V
White level control voltage :		-1 .... 3 V
DC video output current :		max. 5 mA
Positive video DC out level (V_{11}=5.5V):		typ. 5.6 V
Negative video DC out level :		4.8 / 6.4 V
Negative video output current :		typ. 3.2 mA



PACKAGE MP-117 / TOP VIEW

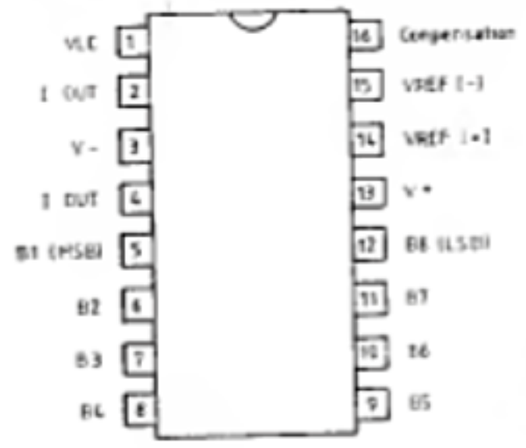
BANEASA S.A.

8-BIT DIGITAL-TO-ANALOG CONVERTORS

DAC 08H
DAC 08E
DAC 08C

Features :

Operating temperature :		0 ... +70°C
Supply voltage :		±4.5 /±18 V
Differential input voltage :		V- ... V+ V
Common mode input voltage :		V- ... V+ V
Settling time :		typ. 100 ns
Nonlinearity over FULL SCALE :	DAC 08H	max ±0.10 %
	DAC 08E	max ±0.19 %
	DAC 08C	max ±0.39 %



PACKAGE MP-117 / TOP VIEW

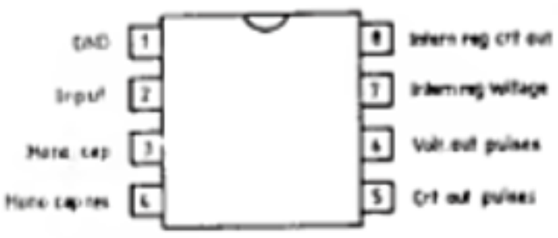
PULSE SHAPER CIRCUITS FOR REVOLUTION COUNTERS

SAK 215MN
SAK 215VN
SAK 215N

Features :

Operating temperature :	SAK 215MN	-55 /+125°C
	SAK 215VN	-25...+85°C
	SAK 215 N	0 ... +70°C
Supply voltage :		nom. 12 V
Supply current :		max. 12 mA
Internal regulator voltage :		7.4 / 8.2 V
Output voltage pulse amplitude :		2 ... 2.5 V

Designed for frequency-to-current converters.



PACKAGE MP-48 / TOP VIEW

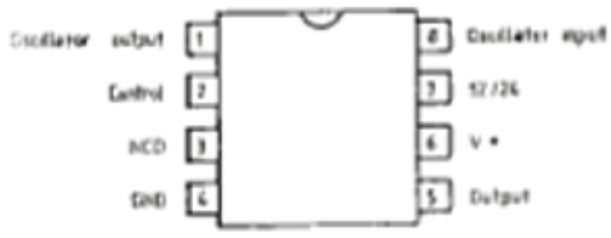
POWER TIMER

TBA 315N

Features :

Operating temperature :		0 ... +70°C
Supply voltage :		10 ... 32 V
Supply current (V-15V) :		3.5 / 18 mA
Control voltage :		0 ... V_{CC} V
Output voltage (I=175mA) :		max. 1.5 V
Output current :		max. 200 mA
Duty cycle (V_{CC}=12V) :		40 ... 65 %
Power dissipation :		max. 300 mW

TO-116 case available for max. 0.5W power dissipation (TBA 315F)



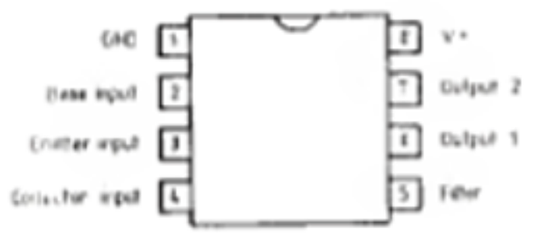
PACKAGE MP-48 / TOP VIEW

INDUCTIVE PROXIMITY SENSOR

TCA 105N

Features :

Operating temperature :		0 ... +70°C
Supply voltage :		4.5 ...20 V
Threshold input voltage :		300...500mV
Hysteresis :		25... 50mV
Supply current :		max. 5 mA
Low-level output voltage @ 50 mA :		max. 1.15 V
Residual output current @ 20 V :		max. 60 uA
Switching time :		typ. 3 us



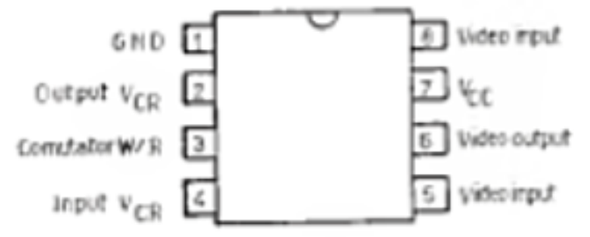
PACKAGE MP-48 / TOP VIEW

VIDEO SWITCH

TDA 5850

Features :

Operating temperature :		-25 / +70°C
Supply voltage :		10 ...16 V
Supply current :		15 ..30 mA
Gain G2/8 :		typ 1/3
Gain G5/8 :		typ 1
Gain G6/8 :		typ 1
Gain G6/4 :		typ 3
Gain G5/4 :		typ 3



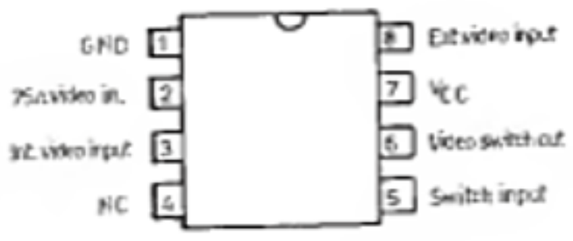
PACKAGE MP-48 / TOP VIEW

VIDEO SWITCH

TEA 2014A

Features :

Operating temperature :	-25 ...	+70°C
Supply voltage :	8	14 V
Supply current :	typ.	75 mA
Gain G6/8 :	+5	+7 dB
Gain G6/3 :	-1	0 dB
Gain G2/3 :	-1.8..-0.4	dB



PACKAGE MP-48 / TOP VIEW

BANEASA S.A.

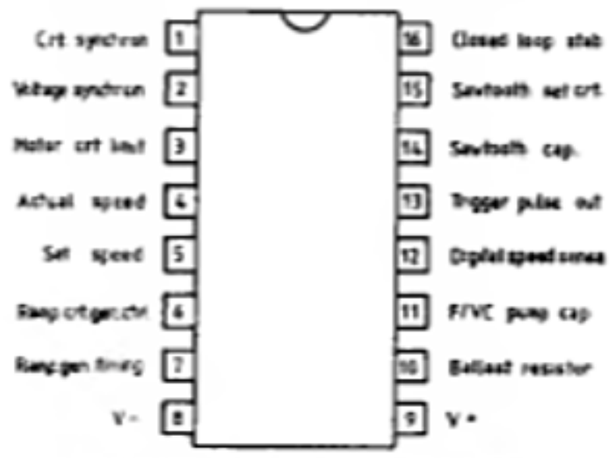
UNIVERSAL AC MOTORS SPEED CONTROLLER

TDA 1085A

Features :

Operating temperature :	0 ... +70°C
Regulated voltage :	typ. 15.5 V
Control-amplifier transconductance :	max.300uA/V
Trigger-pulse repetition period :	max. 215 us
Trigger-pulse width :	max. 100 us
Output leackage current :	max. 30 uA

Guaranteed full-wave triac-drive.



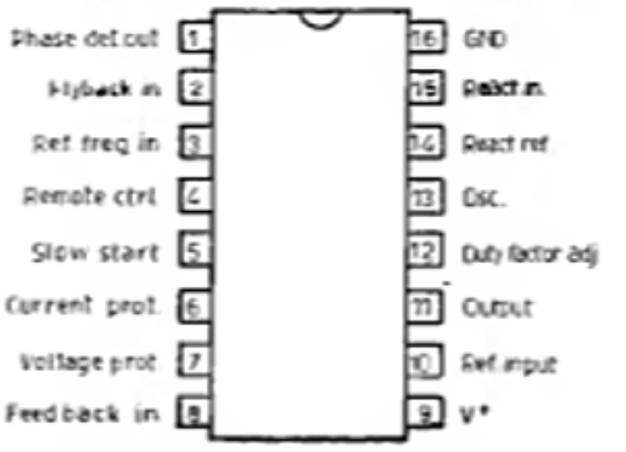
PACKAGE MP-117 / TOP VIEW

CONTROL CIRCUITS FOR SWITCHED-MODE POWER SUPPLIES

TDA 2581
TDA 2582

Features : TDA 2581 controls the duty factor of the positive-going transient of the output signal while TDA 2582 controls the negative-going transient.

	TDA 2581	TDA 2582
Operating temperature :	-25...+70°C	-25...+70°C
Supply voltage :	typ. 12 V	typ. 12 V
Horizontal drive pulse :	typ. 11 V_{PP}	5 ...11 V_{PP}
Flyback pulse (diff. defl.)	typ. 5 V_{PP}	1 ... 5 V_{PP}
External reference voltage:	typ. 6.7 V	typ. 6.1 V



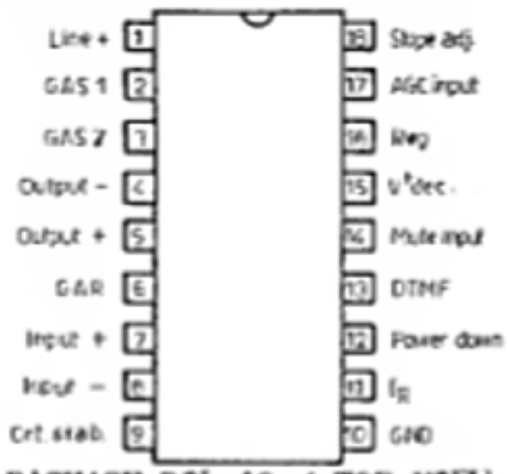
PACKAGE MP-117 / TOP VIEW

TELEPHONE TRANSMISSION CIRCUITS WITH DIALLER INTERFACE

TEA 1060
TEA 1061

Features :

Operating temperature :		-25...+75°C
Line voltage at I_{line}=15mA :		typ. 4.45 V
Line current operating range :		10...140 mA
Supply current (power input HIGH/LOW) :		typ.55u/1mA
Amplification control range :		typ. 5.9 dB
Voltage Amplif. Range (receiving ampl.)		17 ...39 dB
V.A.R. (microphone amplifier)	TEA 1060 :	44 ...60 dB
	TEA 1061 :	30 ...46 dB



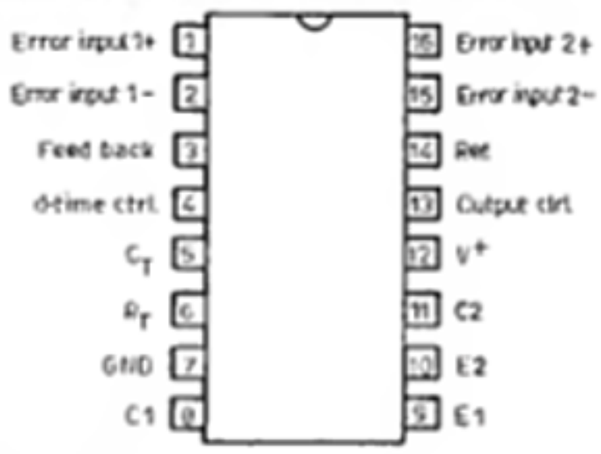
PACKAGE DIL-18 / TOP VIEW

PULSE-WIDTH-MODULATION CONTROL CIRCUIT

$ TL 494

Features (Preliminary Data) :

Operating temperature :	0 ... +70°C
Supply voltage :	7 .... 40 V
Amplifier input voltage :	0.3 /V+-2 V
Reference output voltage :	max. 5 V
Collector output voltage :	max. 40 V
Collector output current :	max. 200 mA
Current into feedback terminal :	max. 0.3 mA
Oscilletor frequency :	1...300 kHz



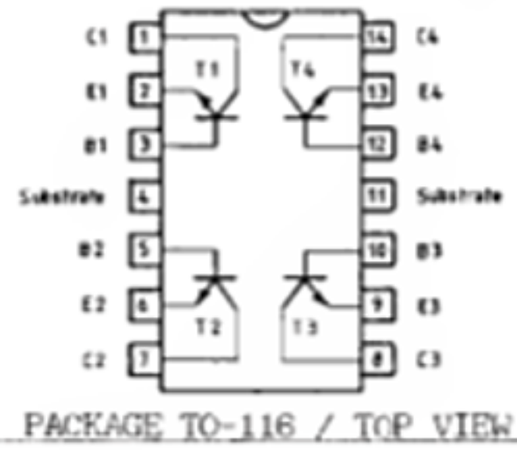
PACKAGE MP-117 / TOP VIEW

TRANSISTOR ARRAYS

β 340D
β 342D

Features :

Operating temperature :		-25...+70°C
Collector-emitter voltage , V_{CEO} :		max. 15 V
Collector-base voltage , V_{CBO} :		max. 20 V
Collector-substate voltage , V_{CSO} :		max. 30 V
Current gain (transistor T1) , h_{FE} :		56 ... 560
Current gain matching :		0.8 .. 1.25
Base-emitter volt. matching (β 340D) :		max. 5 mV
Collector current :		max. 10 mA



PACKAGE TO-116 / TOP VIEW

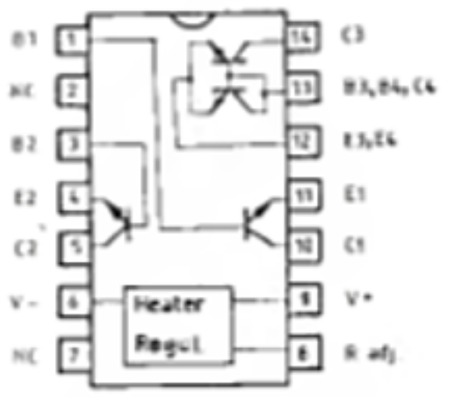
TEMPERATURE CONTROLLED TRANSISTOR ARRAYS

BA 726

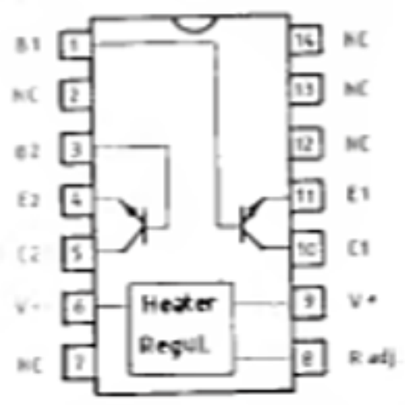
BA 726X

Features :	BA 726	BA 726X
Transistor pair offset voltage :	max. ±3	max. ±1 mV
Max. bias current @ I_C=100uA :	6	1 nA
Max. bias current @ I_C=10uA :	300	200 nA
Current mirror precision :	± 20 %	inexistent
Collector-base voltage , V_{CBO} :	max.	40 V
Collector-substate voltage , V_{CSS} : ...	max.	40 V
Emitter-base reverse voltage , V_{EBO} :	max.	5 V
Current through any transistor :	max.	5 mA
Thermostat supply current :	max.	50 mA
Operating temperature :	0 ...	+70 °C
On-chip temperature :	max.	+125 °C
Power dissipation :	max.	500 mW
Case-ambiental thermal resistance : ...		200 °C/W

APPLICATIONS (HEATER SUPPLYING)



BA 726 / PACKAGE TO-116

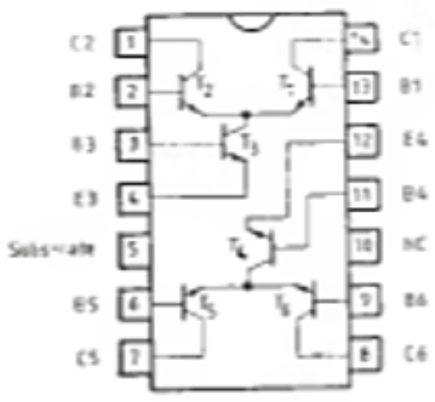


BA 726X / PACKAGE TO-116

DUAL DIFFERENTIAL STAGE

BA 3054

Features :		
Operating temperature :	0 ...	+70 °C
Collector-base voltage , V_{CBO} :	max.	20 V
Collector-emitter voltage , V_{CEO} :	max.	15 V
Emitter-base reverse voltage , V_{EBO} :	max.	5 V
Collector current :	max.	50 mA
DC current gain per transistor :	typ.	150 -
Input offset voltage :	max.	5 mV
Input offset current :	max.	2 uA

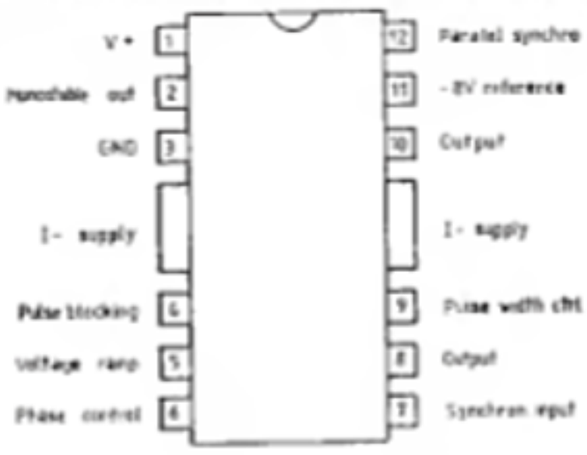


PACKAGE TO-116 / TOP VIEW

PHASE-CONTROL REGULATOR FOR THYRISTORS & TRIACS

BAA 145

Features :		
Operating temperature	0 ...	+70 °C
Supply voltage	max.	+18 V
Positive supply current (pin 1)	12 ...	30 mA
Negative supply current (pin 13)	max.	25 mA
Negative supply current (pin 15)	max.	5 mA
Synchronisation current	max.	10 mA
Phase-control input current	max.	10 uA
Output current	max.	20 mA



PACKAGE CB-109B / TOP VIEW

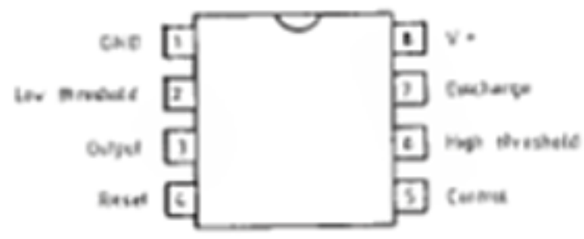
TIMERS

BE 555MN

BE 555N

Features :		
Operating temperature :	BE 555MN	-55 /+125°C
	BE 555N	0 ... +70°C
Supply voltage :		4.5 ... 18 V
Reset voltage :		0.4 ... 1 V
Supply current :		max. 15 mA
Sink/Source output current :		max. 200 mA
Threshold voltage :		typ. 2V+/3 V
Power dissipation :		max. 300 mW

TO-116 case available for max. 0.5W power dissipation (BE 555M, E)



PACKAGE MP-48 / TOP VIEW

LINEAR MAGNETIC HALL TRANSDUCERS, DIFFERENTIAL OUTPUT

BH 1

BH 2

Features : BH 1 and BH 2 are ICs equivalent with a resistor bridge , sensitive to the magnetic field variations.

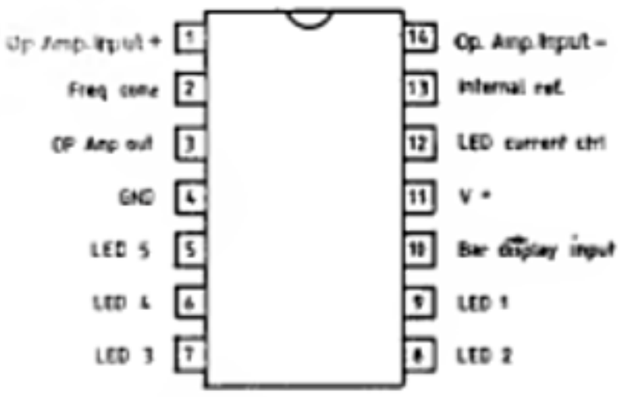
Operating temperature :	0 ...	+70°C
Supply voltage :	0	18 V
Output offset voltage (V+=5V) :	BH 1	-2 ...+12mV
	BH 2	-12 ...+2mV
Supply current (V=5V) :	max.	3 mA
Differential output voltage (B=40mT) :	min.	± 8 mV

PACKAGE MP-24 / TOP VIEW

BAR-GRAPH DISPLAY DRIVERS

βL 105
βL 106
βL 107
βL 108

Features: For driving 5 or (if used in pair) 10 LED serial bar display at 0 to 20 mA current.
Operating temperature : ..... -25...+70°C
Supply voltage : ..... 12 ... 18 V
Incorporated Op. Amp. open-loop gain : min. 10,000
Input thresholds: βL 105 0.1 /0.3 /0.5 /0.7 /0.9 V
βL 106 0.2 /0.4 /0.6 /0.8 / 1 V
-20/-10/-3/0/+3dB βL 107 0.1 /0.31/0.71/ 1 /1.41 V
-15/-6/-1.5/1.5/6 βL 108 0.18/0.5 /0.84/1.19 / 2 V



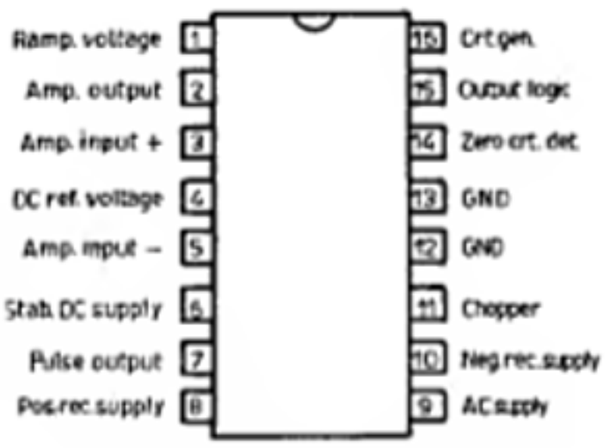
PACKAGE TO-116 / TOP VIEW

TRIAC/SCR PHASE CONTROLLER

βL 120A

Features :

Operating temperature	0 ...	+70	°C
AC peak supply current (pin 9) :	max.	60	mA
Input current (pin 14) :	max.	20	mA
Input diodes peak current :	max.	1	A
Positive clamp voltage (V_{8-12}) :	max.	15	V
Negative clamp voltage (V_{10-12}) :	max.	15	V
Differential input voltage (V_{1-2}) : ...	-7 ...	+7	V
Differential input voltage (V_{3-5}) : ...	-8 ...	+8	V



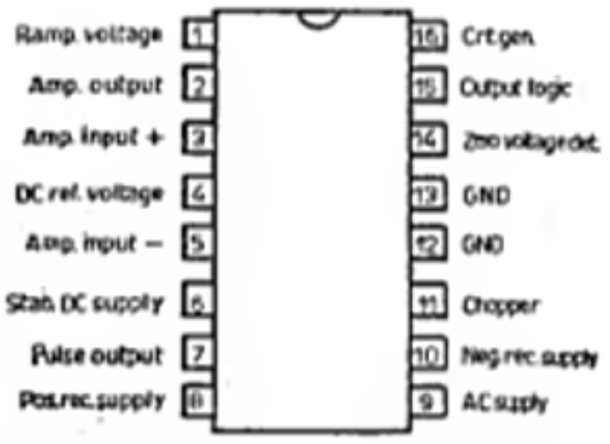
PACKAGE MP-117 / TOP VIEW

TRIAC/SCR BURST CONTROLLER

βL 121A

Features :

Operating temperature	0 ...	+70	°C
AC peak supply current (pin 9) :	max.	60	mA
Input voltage (pin 14) :	max.	20	V
Input diodes peak current :	max.	1	A
Positive clamp voltage (V_{8-12}) :	max.	15	V
Negative clamp voltage (V_{10-12}) :	max.	15	V
Differential input voltage (V_{1-2}) : ...	-7 ...	+7	V
Differential input voltage (V_{3-5}) : ...	-8 ...	+8	V



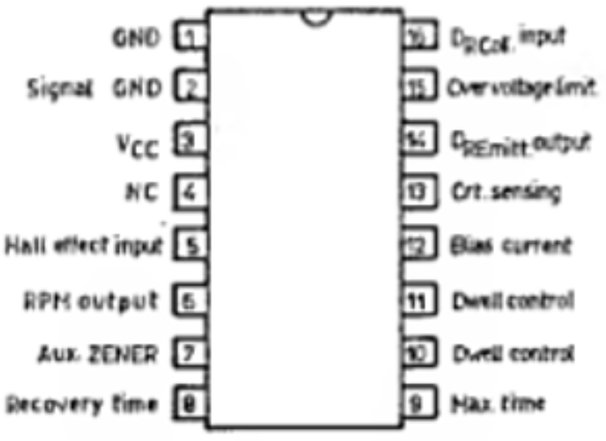
PACKAGE MP-117 / TOP VIEW

✱ HALL EFFECT PICKUP IGNITION CONTROLLER

βL 497B

Features :

Operating temperature :	-50 /+125		°C
Supply voltage :	3.5 ..	28	V
Current limit sensing voltage :	260 ..	370	mV
RPM Saturation voltage (25 mA) :		0.8	V
Darlington driver saturation (180 mA) :		0.9	V
Reference voltage :	1.2 ..	1.3	V
I_{11C}/I_{11D} :	7.8 ..	22	
Percentage of output current determining SRC :	90 ..	98	%



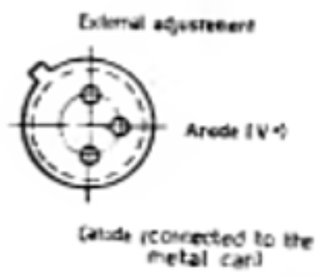
PACKAGE DIL 16 / TOP VIEW

TEMPERATURE LINEAR TRANSDUCERS

βM 135A
βM 335A
βM 335

Features :

	βM 135A	βM 335A	βM 335	
Operating temperature:	-55/+125	-10/+100	-10/+100	°C
Max. initial error :	± 1	± 3	± 6	°C
Typ. nonlinearity over full temperature range :	±0.5	±1.5	±1.5	°C
Temperature sensitivity :			typ. 10mV	/°C
Forward current :			typ. 1	mA
			max. 10	mA
Reverse current :			max. 10	mA



PACKAGE TO-39 / TOP VIEW

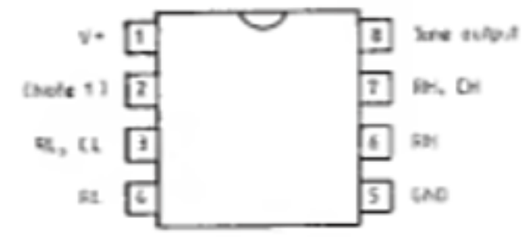
TONE RINGERS FOR TELEPHONE BELL REPLACEMENT

βML 8204

βML 8205

Features :

Operating temperature :	-25	+70 °C
Supply voltage :	max.	36 V
Supply initiation voltage :	17 ...	21 V
Supply initiation current :	1.4 .	4.2mA
Sustaining voltage :	9.7 ..	12 V
Sustaining current :	min.	0.7mA
Trigger voltage (βML 8204 only) :	min.	10.5 V
Disable voltage (βML 8204 only) :	max.	0.8 V



Note 1. Pin 2 function for:
- βML 8204 : Trigger input
- βML 8205 : Init. current

PACKAGE MP-48 / TOP VIEW

HALL-EFFECT MAGNETIC THRESHOLD SENSORS

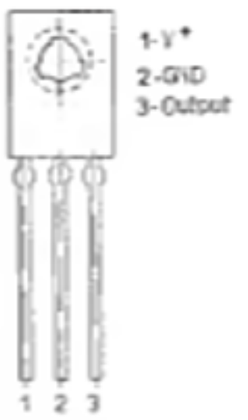
βS 053

βS 057

βS 255

Features : Open collector output

Operating temperature :		0 ...	+70 °C
Supply voltage :		4.5...	5.5 V
Supply current :		max.	6.5 mA
Output voltage in "ON" state (I_O=16mA):		max.	400 mV
Output current in "OFF" state :		max.	10 uA
"ON/OFF" magnetic thresholds :	βS 053	5 /	30 mT
	βS 057	5 /	70 mT
	βS 255	25 /	50 mT



PACKAGE TO-126 (SOT 32)

HALL-EFFECT MAGNETIC THRESHOLD BENSORS

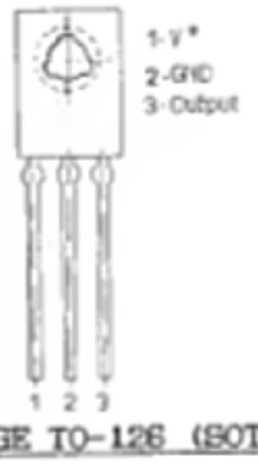
βSM 231

βSM 232

βSM 233

βSM 234

Features :	βSM 231,232	βSM 233,234
Operating temperature :	0 ...+70 °C	0 ...+70 °C
Supply voltage :	max. 25 V	max. 10 V
Supply current :	max. 6.5 mA	max. 10 mA
"ON" state output voltage:	max. 400 mV	max. 500 mV
"OFF" state out. current :	max. 10 uA	max. 250 uA
Magnetic thresholds : βSM 231, βSM 233	5... 30 mT	
βSM 232	25... 50 mT	
βSM 234	5... 70 mT	



PACKAGE TO-126 (SOT 32)

20 V SEMI-CUSTOM DESIGN COMPONENTS ARRAY

UNICIP 1000

UNICIP 1000 is a standard array dedicated to custom original (or model based) projects. IC's like: TCA 520N, FZH 100 series, βU 1010N, βU 1011, β 340D or βU 1014N are processed on UNICIP 1000 chip.
The customer may design himself the layout of a new IC , using a 250 times enlarged layout sheet. This step is similar to a P.C. board design. The basic components set of UNICIP 1000 (transistors, diodes, resistors) is packaged in 5 ICs (βU 1001 to βU 1005), dedicated to the "semi-discrete" simulation of the project.

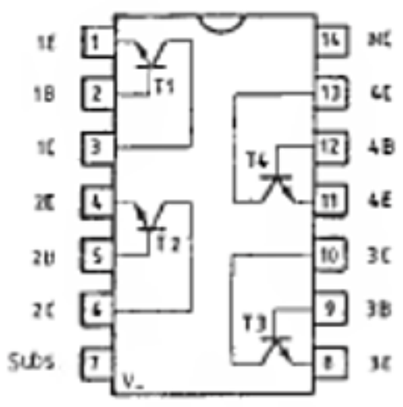
UNICIP 1000 component list :

10 mA NPN transistors	28 pcs.			
150 mA NPN transistors	2 pcs			
2-collectors lateral PNP transistors	7 pcs.			
Vertical PNP transistors	3 pcs.			
7.3 V Zener diode	1 pcs.			
P-diffusion resistors :				
0.25 kohms	2 pcs.			
0.5 kohms	21 pcs.	2 kohm	36 pcs.	
1 kohm	20 pcs.	4 kohms	12 pcs.	
Pinch resistors (typ. 35 kohms)	2 pcs.			
Pads for pin connection	14 pcs.			

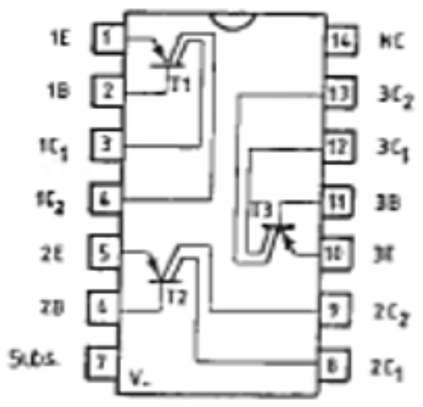
Features :

Supply voltage	max.	20 V
NPN current gain (I_C = 2 mA)	typ.	150 -
Lat. PNP current gain (I_C=0.2mA)	typ.	10 -
P-diffusion resistor tolerance	max.	25 %
Pinch resistor tolerance	-50/	+100 %
Typ. Zener diode voltage drift	0.01	%/ °C
On-chip temperature	max.	125 °C

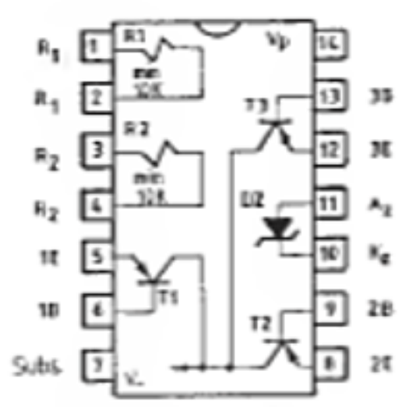
Power dissipation : depending on the package utilised
Temperature range : depending on the project design



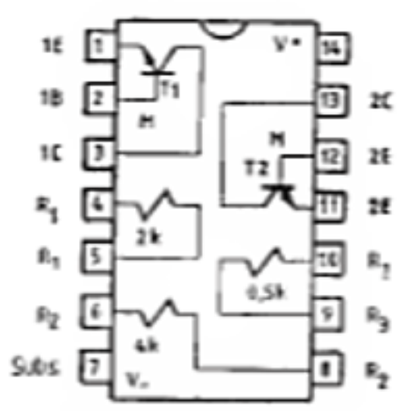
βU 1001



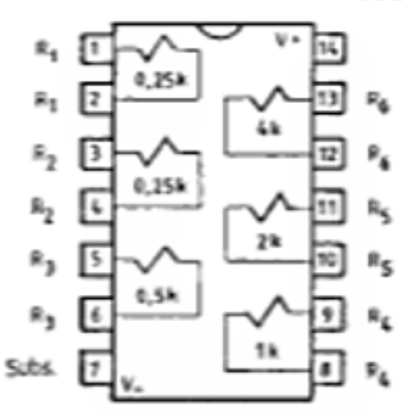
βU 1002



βU 1003



βU 1004



βU 1005

40 V SEMI-CUSTOM DESIGN COMPONENTS ARRAY

UNICIP 2000

Processed in a 40 V technology , UNICIP 2000 contains over 170 electronic components : 104 resistors with over 350 kohms total value , 61 transistors (including 4 NPN 300 mA power drivers), 6 V Zener diodes, one FET transistor etc. Same as UNICIP 1000, the interconnection mask may be designed by the client on a 250 times enlarged sheet. The basic components set of the UNICIP 2000 array is packaged in 3 ICs (βU 2001, βU 2002 and βU 2003) and is dedicated to model developping.

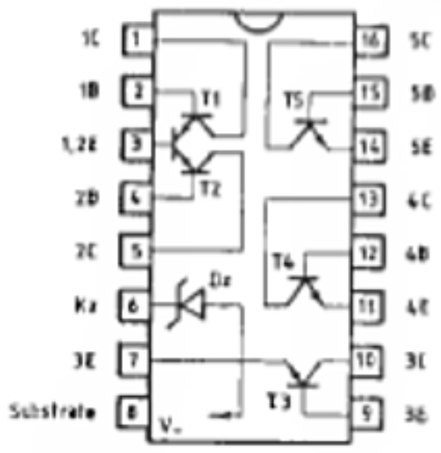
UNICIP 2000 component list :

10 mA NPN transistors	38 pcs.			
300 mA NPN transistors	4 pcs.			
2-collectors PNP-lateral transistors	12 pcs.			
8-collectors PNP-lateral transistors	1 pc.			
Vertical PNP transistors	6 pcs.			
J-FET current generator	1 pc.			
6 V Zener diodes	2 pcs.			
P-diffusion resistors :				
0.5 kohms	16 pcs.			
1 kohm	16 pcs.	4 kohms	28 pcs.	
2 kohms	18 pcs.	8 kohms	22 pcs.	
35 kohms Pinch resistors	4 pcs.			
30 pF capacitors	2 pcs.			
Pads for pin connection	16 pcs.			

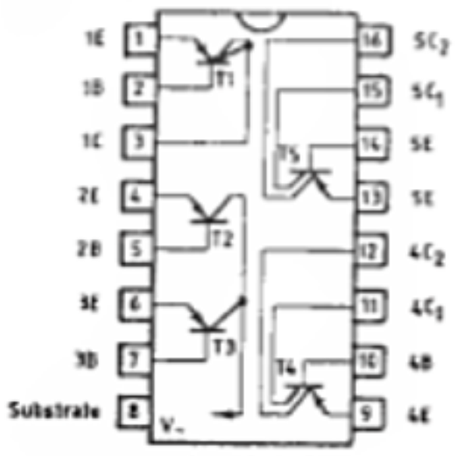
Features :

Supply voltage	max.	40 V
NPN power collector resistance (I_C=200mA)	typ.	5 ohms
NPN current gain (I_C=2 mA)	typ.	100 -
Lat. PNP current gain (I_C=0.2mA)	typ.	10 -
Base-diff. resistor tolerance	max.	25 %
Pinch resistor tolerance	-50/	+100 %
Zener diode voltage	5.7 /	6.3 V
Chip temperature	max.	125°C

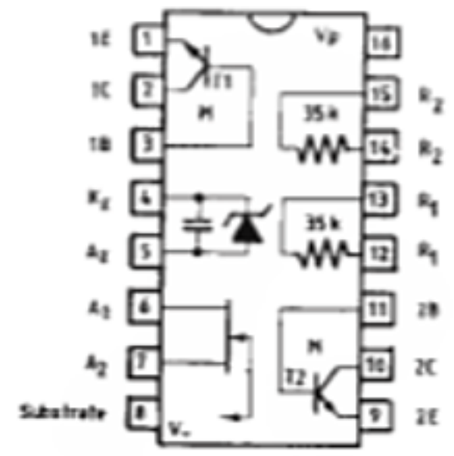
Power dissipation : depending on the package utilised
Temperature range : depending on the project design



βU 2001



βU 2002



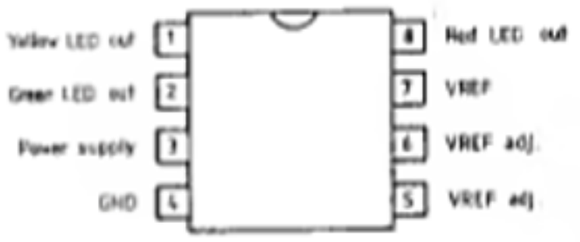
βU 2003

12V ACCUMULATOR VOLTAGE INDICATOR (3 LED DRIVER)

BU 1010N

Features :

Operating temperature :		-40...+85°C
Supply voltage :		8 ... 18 V
Output current :		max. 25 mA
Typ. reference voltage drift :		0.2 mV/°C
Lighting volt. intervals:	below 11.3 V	Red LED
	11.3 to 13 V	Yellow LED
	13 to 15.2 V	Green LED
	over 15.2 V	Red & Green



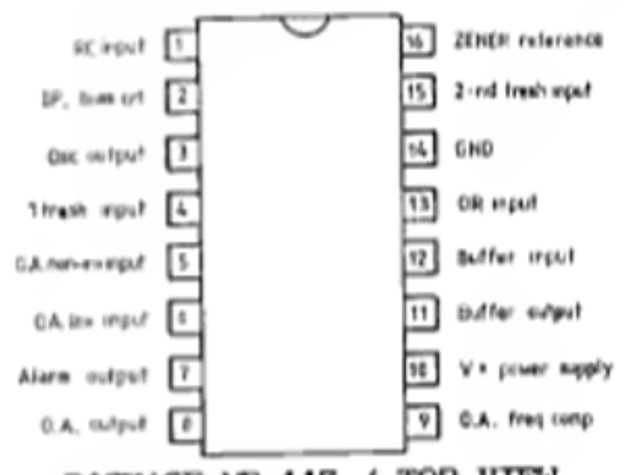
PACKAGE MP-48 / TOP VIEW

ALARM GENERATOR

BU 1011

Features :
Contains 3 independent blocks : an alarm detector (2 voltage comparators with a logic AND/OR circuit) an 100mA open collector driver and an Op.Amp.

Operating temperature :		-25...+85°C
Supply voltage :		8 ...20 V
Internal polarised ZENER voltage :		6.8 ..7.8 V
Low-level output voltage at 100 mA :		max. 2.0 V
Operational amplifier open loop gain :		typ. 100000



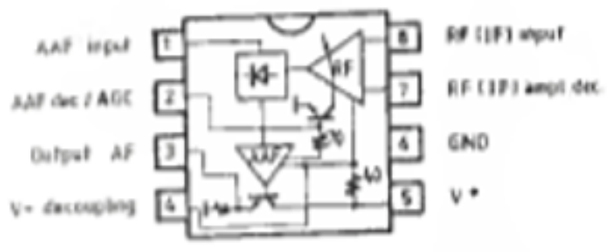
PACKAGE MP-117 / TOP VIEW

1.5V SUPPLY AM RADIO RECEIVER

BU 1014N

Features :

Operating temperature :		0 ... +70°C
Supply voltage :		1.1 ... 2 V
Supply current (R_{load}=100ohms) :		max. 10 mA
Operating frequency :		max. 2 MHz
RF input amplitude :		max. 30 mV
RF input impedance :		min. 300 kΩ
Sensibility (fi=1MHz, fm=1kHz, m=30%)		max. 1 mV
AGC efficiency @ 6dB out AF nonuniform.		typ. 30 dB



PACKAGE MP-48 / TOP VIEW

UNICIP 3000

Processed in a 40 V technology, UNICIP 3000 includes 4 Super-β tranzistors and has 16 pads.

UNICIP 3000 component list:

10 mA NPN transistors	46 pcs.
10 mA super-β transistors	4 pcs.
300 mA NPN transistors	4 pcs.
2-collectors PNP-lateral transistors	24 pcs.
Vertical PNP transistors	4 pcs.
Capacitor	1 pc.
P-diffusion resistors:	
0.5 Kohms	28 pcs.
1 Kohm	14 pcs.
2 Kohms	21 pcs.
4 Kohms	35 pcs.
8 Kohms	21 pcs.

Features:

Supply voltage		max. 40 V
NPN current gain (I_o=2 mA)		typ. 100
Super-β gain		typ. 1000
Lateral PNP current gain		min. 10
Chip temperature		max. 125°C
Power dissipation:	depending on the package utilised	
Temperature range:	depending on the project design	

T.T.L. LOW POWER SCHOTTKY

β 74LS00	β 74LS20	β 74LS55	β 74LS161
β 74LS02	β 74LS21	β 74LS74	β 74LS162
β 74LS03	β 74LS22	β 74LS86	β 74LS163
β 74LS04	β 74LS27	β 74LS123	β 74LS174
β 74LS05	β 74LS28	β 74LS125	β 74LS175
β 74LS08	β 74LS30	β 74LS126	β 74LS241
β 74LS09	β 74LS32	β 74LS132	β 74LS253
β 74LS10	β 74LS33	β 74LS136	β 74LS257
β 74LS11	β 74LS37	β 74LS138	β 74LS258
β 74LS12	β 74LS38	β 74LS153	β 74LS266
β 74LS13	β 74LS40	β 74LS157	β 74LS386
β 74LS14	β 74LS51	β 74LS158	
β 74LS15	β 74LS54	β 74LS160	

T.T.L. STANDARD

β 5400 (CDB 400EM)	β 5454 (CDB 454EM)	β 7400 (CDB 400E)	β 7454 (CDB 454E)
β 5402 (CDB 402EM)	β 5460 (CDB 460EM)	β 7402 (CDB 402E)	β 7460 (CDB 460E)
β 5403 (CDB 403EM)	β 5472 (CDB 472EM)	β 7403 (CDB 403E)	β 7472 (CDB 472E)
β 5404 (CDB 404EM)	β 5473 (CDB 473EM)	β 7404 (CDB 404E)	β 7473 (CDB 473E)
β 5405 (CDB 405EM)	β 5474 (CDB 474EM)	β 7405 (CDB 405E)	β 7474 (CDB 474E)
β 5406 (CDB 406EM)	β 5475 (CDB 475EM)	β 7406 (CDB 406E)	β 7475 (CDB 475E)
β 5407 (CDB 407EM)	β 5476 (CDB 476EM)	β 7407 (CDB 407E)	β 7476 (CDB 476E)
β 5408 (CDB 408EM)	β 5481 (CDB 481EM)	β 7408 (CDB 408E)	β 7481 (CDB 481E)
β 5409 (CDB 409EM)	β 5483 (CDB 483EM)	β 7409 (CDB 409E)	β 7483 (CDB 483E)
β 5410 (CDB 410EM)	β 5486 (CDB 483EM)	β 7410 (CDB 410E)	β 7486 (CDB 486E)
β 5413 (CDB 413EM)	β 5490 (CDB 490EM)	β 7413 (CDB 413E)	β 7490 (CDB 490E)
β 5416 (CDB 416EM)	β 5492 (CDB 492EM)	β 7416 (CDB 416E)	β 7492 (CDB 492E)
β 5417 (CDB 417EM)	β 5493 (CDB 493EM)	β 7417 (CDB 417E)	β 7493 (CDB 493E)
β 5420 (CDB 420EM)	β 5495 (CDB 495EM)	β 7420 (CDB 420E)	β 7495 (CDB 495E)
β 5430 (CDB 430EM)	β 54121 (CDB 4121EM)	β 7430 (CDB 430E)	β 74121 (CDB 4121E)
β 5432 (CDB 432EM)	β 54123 (CDB 4123EM)	β 7432 (CDB 432E)	β 74123 (CDB 4123E)
β 5437 (CDB 437EM)	β 54151 (CDB 4151EM)	β 7437 (CDB 437E)	β 74151 (CDB 4151E)
β 5438 (CDB 438EM)	β 54153 (CDB 4153EM)	β 7438 (CDB 438E)	β 74153 (CDB 4153E)
β 5440 (CDB 440EM)	β 54157 (CDB 4157EM)	β 7440 (CDB 440E)	β 74157 (CDB 4157E)
β 5442 (CDB 442EM)	β 54180 (CDB 4180EM)	β 7442 (CDB 442E)	β 74180 (CDB 4180E)
β 5446 (CDB 446EM)	β 54192 (CDB 4192EM)	β 7446 (CDB 446E)	β 74192 (CDB 4192E)
β 5447 (CDB 447EM)	β 54193 (CDB 4193EM)	β 7447 (CDB 447E)	β 74193 (CDB 4193E)
β 5450 (CDB 450EM)	β 5837 (CDB 837EM)	β 7450 (CDB 450E)	β 7837 (CDB 837E)
β 5451 (CDB 451EM)	β 5838 (CDB 838EM)	β 7451 (CDB 451E)	β 7838 (CDB 838E)
β 5453 (CDB 453EM)		β 7453 (CDB 453E)	β 78136 (CDB 8136E)

T.T.L. HIGH SPEED

β 54H00 (CDB 400HEM)	β 54H40 (CDB 440HEM)	β 74H00 (CDB 400HE)	β 74H40 (CDB 440HE)
β 54H10 (CDB 410HEM)	β 54H51 (CDB 451HEM)	β 74H10 (CDB 410HE)	β 74H51 (CDB 451HE)
β 54H11 (CDB 411HEM)	β 54H54 (CDB 454HEM)	β 74H11 (CDB 411HE)	β 74H54 (CDB 454HE)
β 54H30 (CDB 430HEM)		β 74H30 (CDB 430HE)	

Family	Operating Temperature Range	Power Supply range
β 74...	0 °C ... + 70 °C	4.75 V ... 5.25 V
β 54...	-55 °C ... +125 °C	4.50 V ... 5.50 V

Basic Characteristics per NAND Gate @ V_{CC} = 5 V , T_A = 25 °C

Parameter	Value			Unit
	74LS...	54/74...	54H/74H...	
V_{IH} min	2	2	2	V
V_{IL} max	0.7/0.8	0.8	0.8	V
- V_{IK} max @ 10 mA	1.5	1.8	1.8	V
I_{IH} max	20	40	50	uA
- I_{IL} max	0.4	1.6	2	mA
V_{OL} max	0.4/0.5	0.4	0.4	V
V_{OH} min	2.5/2.7	2.4	2.4	V
I_{OL} max	4 / 8	16	20	mA
- I_{OH} max	0.4	0.8	1.0	mA
- I_{OS}	15 ... 100	18 ... 55	40 ... 100	mA
I_{CC} typ @ V_{OL}	0.6	3.0	6.5	mA
I_{CC} typ @ V_{OH}	0.2	1.0	2.5	mA
P_d medium	2	10	22	mW
t_{pLH} typ	9	12	6	ns
t_{pHL} typ	10	8	6.5	ns

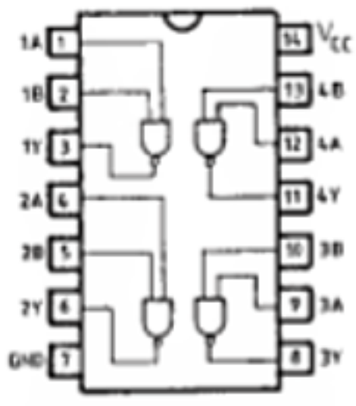
QUAD 2-INPUT NAND GATES

Function : $Y = \overline{A \cdot B}$

β 74LS00

β 7400 (CDB 400E)
β 5400 (CDB 400EM)

β 74H00 (CDB 400HE)
β 54H00 (CDB 400HEM)



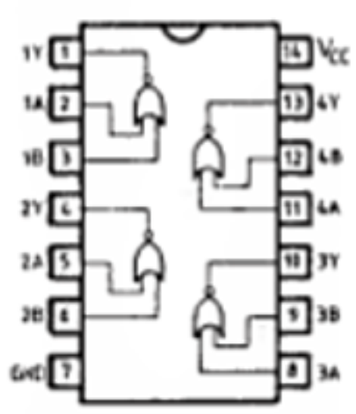
PACKAGE TO-116

QUAD 2-INPUT NOR GATES

Function : $Y = \overline{A + B}$

β 74LS02

β 7402 (CDB 402E)
β 5402 (CDB 402EM)



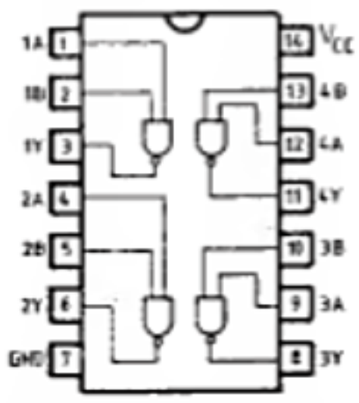
PACKAGE TO-116

QUAD 2-INPUT NAND GATES
WITH OPEN-COLLECTOR

Function : $Y = \overline{A \cdot B}$

β 74LS03

β 7403 (CDB 403E)
β 5403 (CDB 403EM)



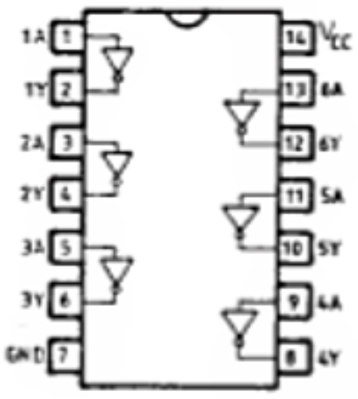
PACKAGE TO-116

HEX INVERTERS

Function : $Y = \overline{A}$

β 74LS04

β 7404 (CDB 404E)
β 5404 (CDB 404EM)



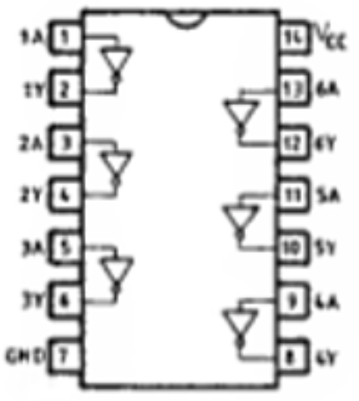
PACKAGE TO-116

HEX INVERTERS WITH
OPEN-COLLECTOR

Function : $Y = \overline{A}$

β 74LS05

β 7405 (CDB 405E)
β 5405 (CDB 405EM)

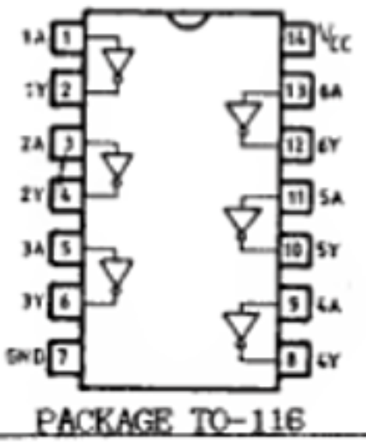


PACKAGE TO-116

HEX INVERTER BUFFERS
WITH 30V OPEN COLLECTOR

Function : $Y = \overline{A}$

β 7406 (CDB 406E)
β 5406 (CDB 406EM)

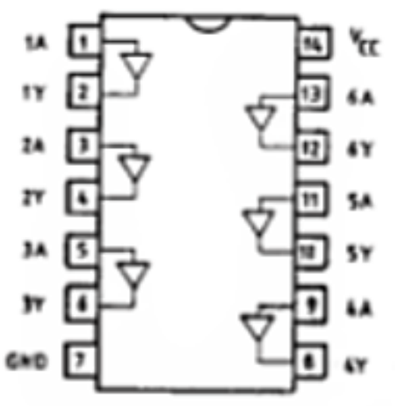


PACKAGE TO-116

HEX BUFFERS WITH
30V OPEN-COLLECTOR

Function : Y = A

β 7407 (CDB 407E)
β 5407 (CDB 407EM)



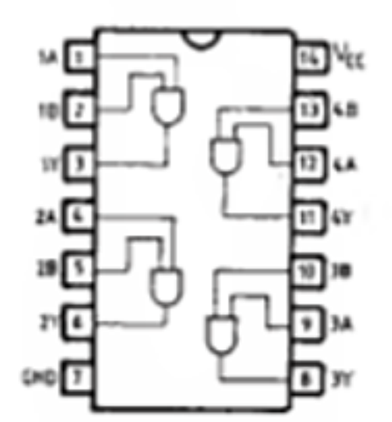
PACKAGE TO-116

QUAD 2-INPUT AND GATES

Function : Y = A . B

β 74LS08

β 7408 (CDB 408E)
β 5408 (CDB 408EM)



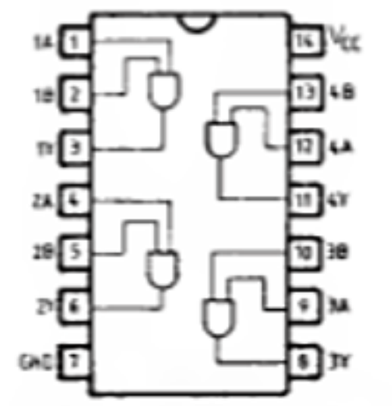
PACKAGE TO-116

QUAD 2-INPUT AND GATES
WITH OPEN-COLLECTOR

Function : Y = A . B

β 74LS09

β 7409 (CDB 409E)
β 5409 (CDB 409EM)



PACKAGE TO-116

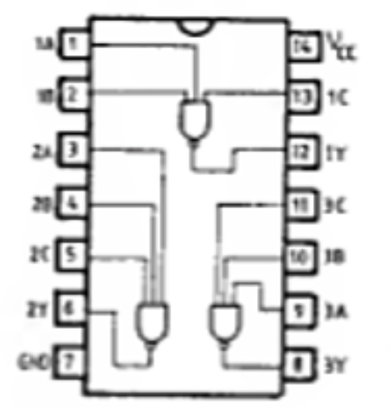
TRIPLE 3-INPUT NAND GATES

Function : $Y = \overline{A \cdot B \cdot C}$

β 74LS10

β 7410 (CDB 410E)
β 5410 (CDB 410EM)

β 74H10 (CDB 410HE)
β 54H10 (CDB 410HEM)



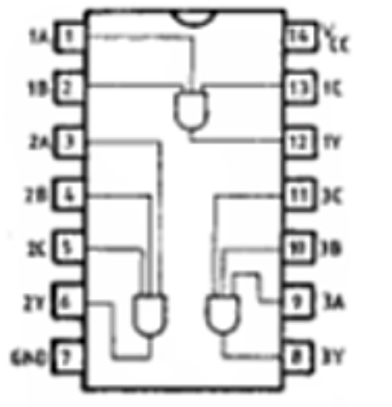
PACKAGE TO-116

TRIPLE 3-INPUT AND GATES

Function : Y = A . B . C

β 74LS11

β 74H11 (CDB 411HE)
β 54H11 (CDB 411HEM)

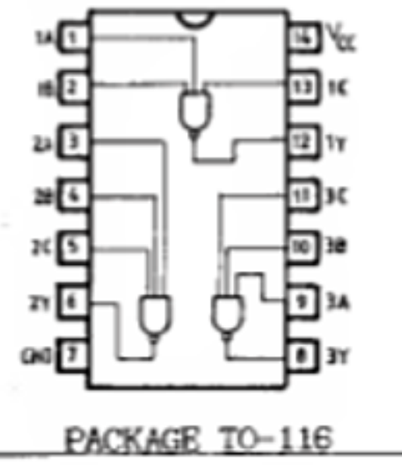


PACKAGE TO-116

TRIPLE 3-INPUT NAND GATES
WITH OPEN-COLLECTOR

Function : $Y = \overline{A \cdot B \cdot C}$

β 74LS12



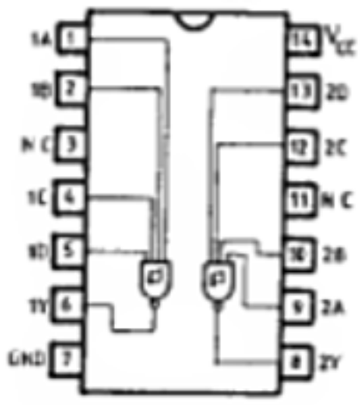
PACKAGE TO-116

DUAL 4-INPUT NAND
SCHMITT-TRIGGERS

Function : $Y = \overline{A.B.C.D}$

β 74LS13

β 7413 (CDB 413E)
β 5413 (CDB 413EM)

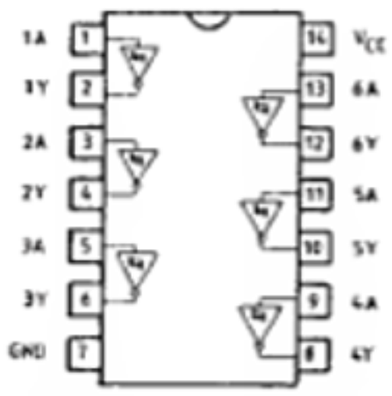


PACKAGE TO-116

HEX SCHMITT-TRIGGER
INVERTERS

Function : $Y = \bar{A}$

β 74LS14

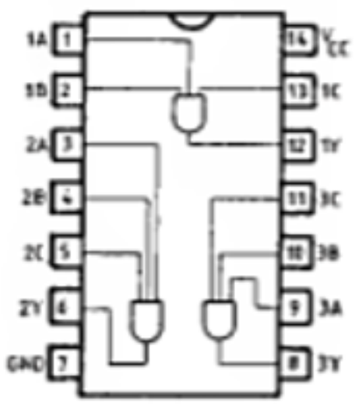


PACKAGE TO-116

TRIPLE 3-INPUT AND GATES
WITH OPEN-COLLECTOR

Function : Y = A . B . C

β 74LS15



PACKAGE TO-116

HEX INVERTER BUFFERS
WITH 15V OPEN-COLLECTOR

Function : Y = A

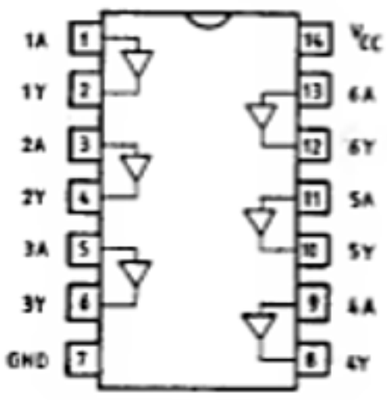
β 7416 (CDB 416E)
β 5416 (CDB 416EM)

PACKAGE TO-116

HEX BUFFERS
WITH 15V OPEN-COLLECTOR

Function : Y = A

β 7417 (CDB 417E)
β 5417 (CDB 417EM)



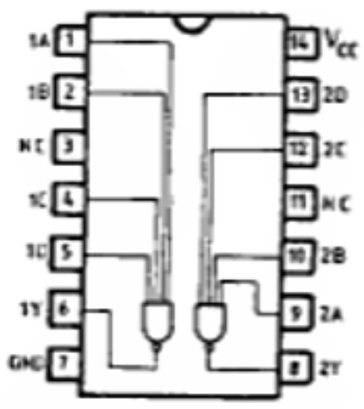
PACKAGE TO-116

DUAL 4-INPUT NAND GATES

Function : $Y = \overline{A.B.C.D}$

β 74LS20

β 7420 (CDB 420E)
β 5420 (CDB 420EM)

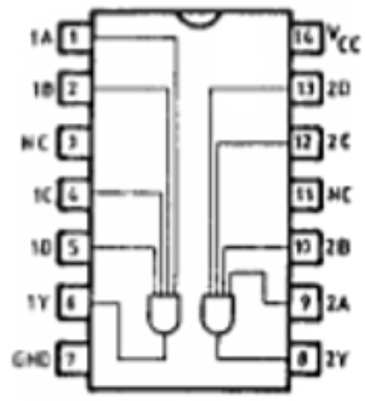


PACKAGE TO-116

DUAL 4-INPUT AND GATES

Function : Y = A.B.C.D

β 74LS21

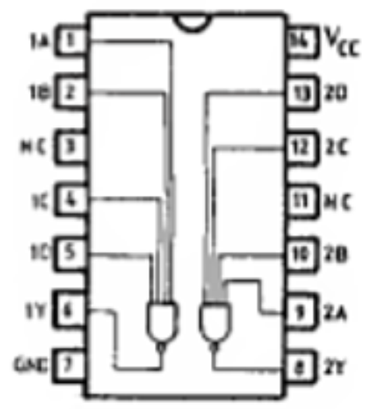


PACKAGE TO-116

DUAL 4-INPUT NAND GATES
WITH OPEN-COLLECTOR

Function : $Y = \overline{A.B.C.D}$

β 74LS22

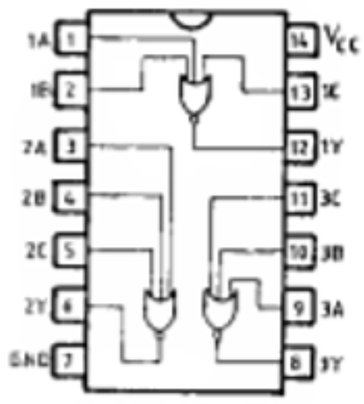


PACKAGE TO-116

TRIPLE 3-INPUT NOR GATES

Function : $Y = \overline{A + B + C}$

β 74LS27

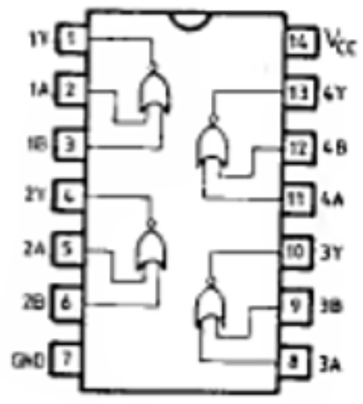


PACKAGE TO-116

QUAD 2-INPUT NOR BUFFERS

Function : $Y = \overline{A + B}$

β 74LS28



PACKAGE TO-116

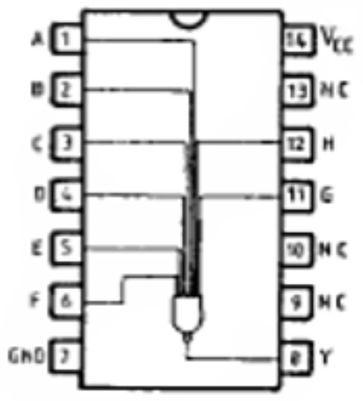
8-INPUT NAND GATES

Function: $Y = \overline{A.B.C.D.E.F.G.H}$

β 74LS30

β 7430 (CDB 430E)
β 5430 (CDB 430EM)

β 74H30 (CDB 430HE)
β 54H30 (CDB 430HEM)



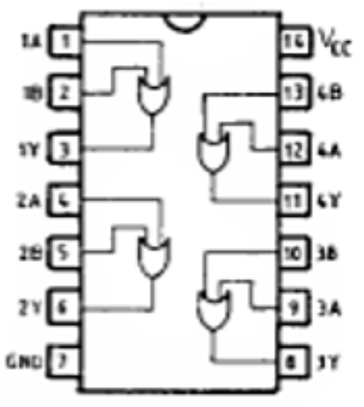
PACKAGE TO-116

QUAD 2-INPUT OR GATES

Function : Y = A + B

β 74LS32

β 7432 (CDB 432E)
β 5432 (CDB 432EM)

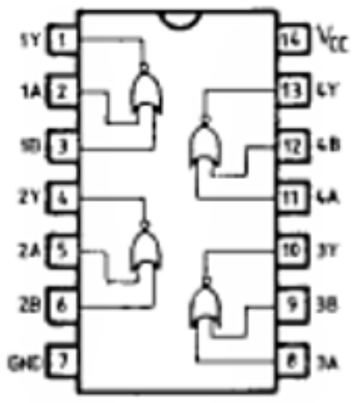


PACKAGE TO-116

QUAD 2-INPUT NOR BUFFERS
WITH OPEN-COLLECTOR

Function : $Y = \overline{A + B}$

β 74LS33



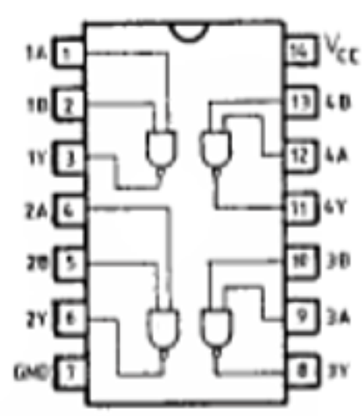
PACKAGE TO-116

QUAD 2-INPUT NAND BUFFERS

Function : $Y = \overline{A \cdot B}$

β 74LS37

β 7437 (CDB 437E)
β 5437 (CDB 437EM)



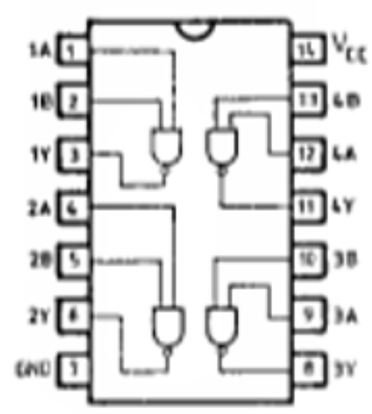
PACKAGE TO-116

QUAD 2-INPUT NAND BUFFERS
WITH OPEN-COLLECTOR

Function : $Y = \overline{A \cdot B}$

β 74LS38

β 7438 (CDB 438E)
β 5438 (CDB 438EM)



PACKAGE TO-116

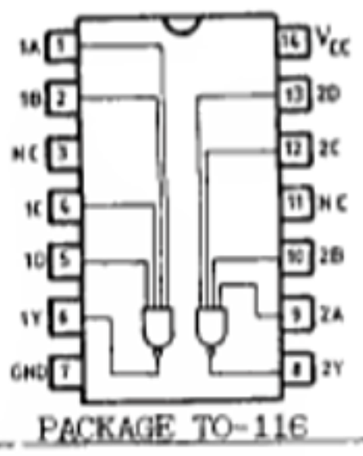
QUAD 2-INPUT NAND BUFFERS

Function : $Y = \overline{A \cdot B}$

β 74LS40

β 7440 (CDB 440E)
β 5440 (CDB 440EM)

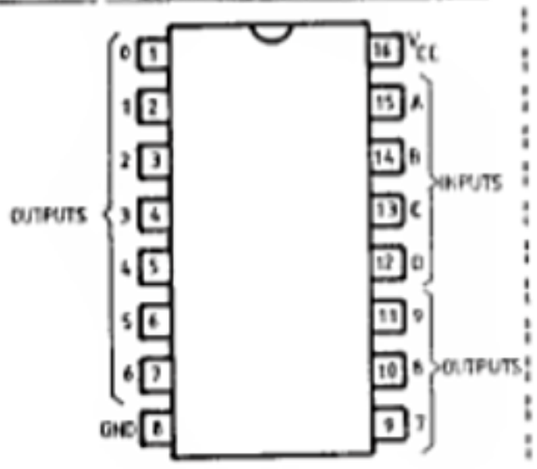
β 74H40 (CDB 440HE)
β 54H40 (CDB 440HEM)



PACKAGE TO-116

4-TO-10 LINE DECODER
(BCD-TO-DECIMAL)

β 7442 (CDB 442E)
β 5442 (CDB 442EM)



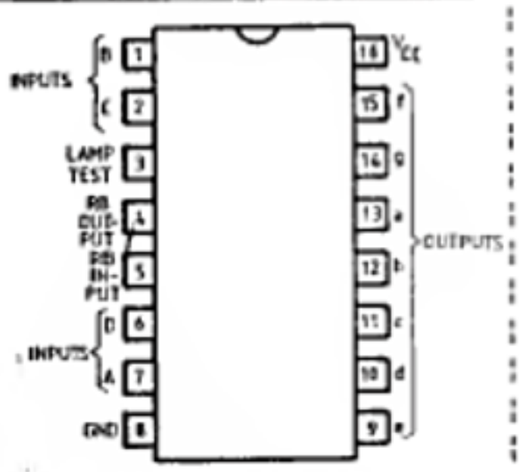
PACKAGE MP-117

BCD-TO-7-SEGMENT DECODERS
= WITH 30V OPEN-COLLECTOR

β 7446 (CDB 446E)
β 5446 (CDB 446EM)

= WITH 15V OPEN-COLLECTOR

β 7447 (CDB 447E)
β 5447 (CDB 447EM)



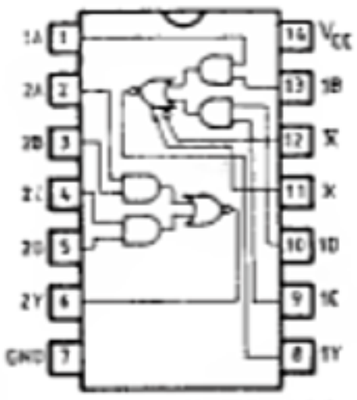
PACKAGE MP-117

DUAL 2-WIDE 2-INPUT AND-OR-
INVERT GATES, ONE EXPANDABLE

Function : $Y = \overline{A.B + C.D + X}$

β 7450 (CDB 450E)
β 5450 (CDB 450EM)

X inputs are compatible with
the outputs of β 7460/β 5460.



PACKAGE TO-116

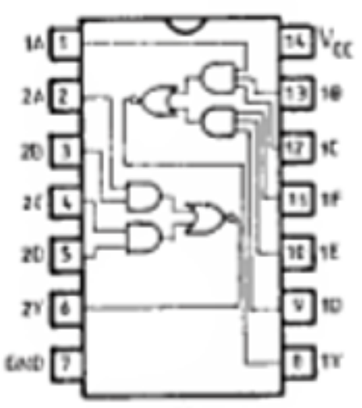
DUAL 2-WIDE, 3-INPUT AND
2-INPUT AND-OR-INVERT GATES

Functions :

$1Y = \overline{1A.1B.1C + 1D.1E.1F}$

$2Y = \overline{2A.2B + 2C.2D}$

β 74LS51



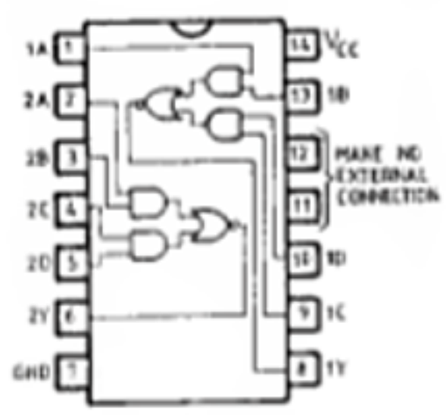
PACKAGE TO-116

DUAL 2-WIDE 2-INPUT
AND-OR-INVERT GATES

Function : $Y = \overline{A.B + C.D}$

β 7451 (CDB 451E)
β 5451 (CDB 451EM)

β 74H51 (CDB 451HE)
β 54H51 (CDB 451HEM)



PACKAGE TO-116

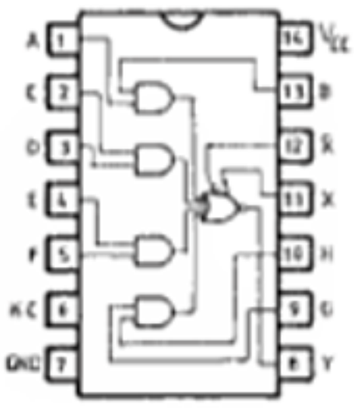
EXPANDABLE 4-WIDE
AND-OR-INVERT GATES

Function :

$Y = \overline{A.B + C.D + E.F + G.H + X}$

β 7453 (CDB 453E)
β 5453 (CDB 453EM)

X inputs are compatible with
the outputs of β 7460/β 5460.



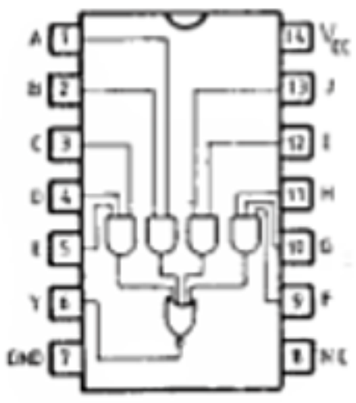
PACKAGE TO-116

4-WIDE 2- & 3-INPUT
AND-OR-INVERT GATE

Function :

$Y = \overline{A.B + C.D.E + F.G.H + I.J}$

β 74LS54



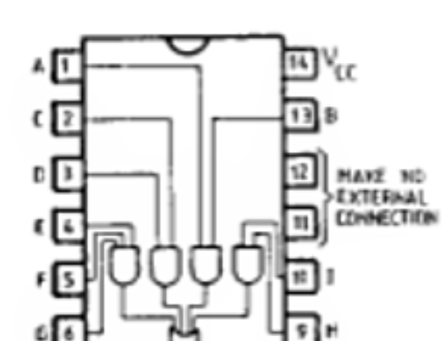
PACKAGE TO-116

4-WIDE 2-INPUT
AND-OR-INVERT GATES

Function :

$Y = \overline{A.B + C.D + E.F + G.H}$

β 7454 (CDB 454E)
β 5454 (CDB 454EM)



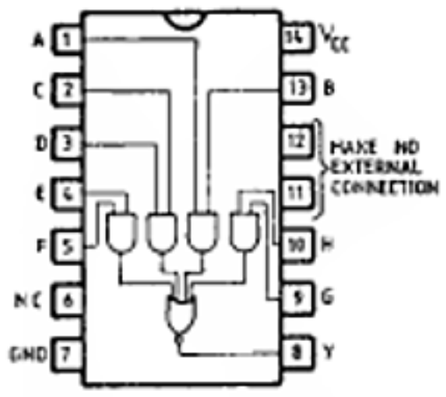
PACKAGE TO-116

4-WIDE 2- AND 3-INPUT
AND-OR-INVERT GATES

Function :

$$Y = \overline{A.B + C.D + E.F.G + H.I}$$

β 74H54 (CDB 454HE)
β 54H54 (CDB 454HEM)



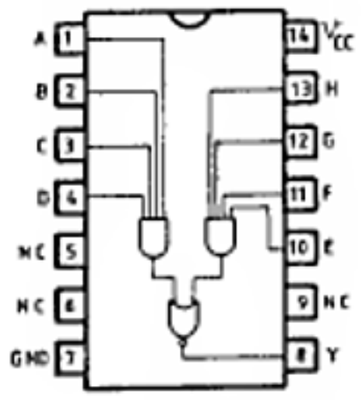
PACKAGE TO-116

2-WIDE 4-INPUT
AND-OR-INVERT GATES

Function :

$$Y = \overline{A.B.C.D + E.F.G.H}$$

β 74LS55



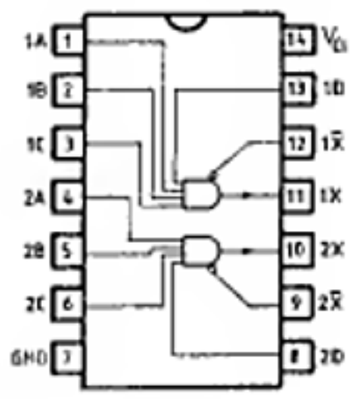
PACKAGE TO-116

DUAL 4-INPUT EXPANDERS

Function : X = A.B.C.D

β 7460 (CDB 460E)
β 5460 (CDB 460EM)

X outputs are compatible with the inputs of β 7450, β 7453.

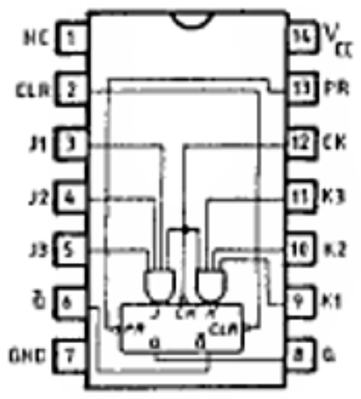


PACKAGE TO-116

AND-GATED J-K MASTER-SLAVE
FLIP-FLOPS, PRESET & CLEAR

β 7472 (CDB 472E)
β 5472 (CDB 472EM)

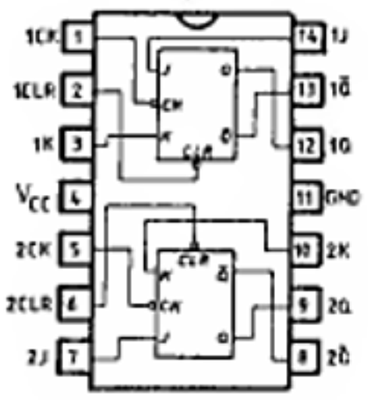
J=J1.J2.J3 ; K=K1.K2.K3



PACKAGE TO-116

DUAL J-K FLIP-FLOPS
WITH CLEAR

β 7473 (CDB 473E)
β 5473 (CDB 473EM)



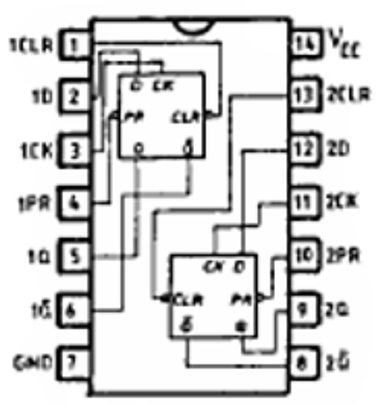
PACKAGE TO-116

DUAL D-TYPE FLIP-FLOPS
WITH PRESET AND CLEAR

β 74LS74

β 7474 (CDB 474E)
β 5474 (CDB 474EM)

Preset and Clear are active low.



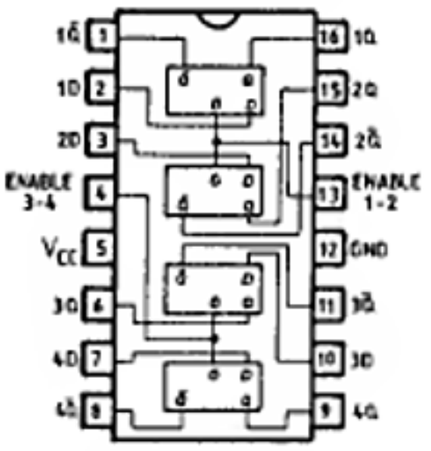
PACKAGE TO-116

4-BIT BISTABLE LATCHES

Function table/latch

Inputs		Outputs	
D	G	Q	$\overline{Q}$
0	1	0	1
1	1	1	0
x	0	Q	$\overline{Q}$

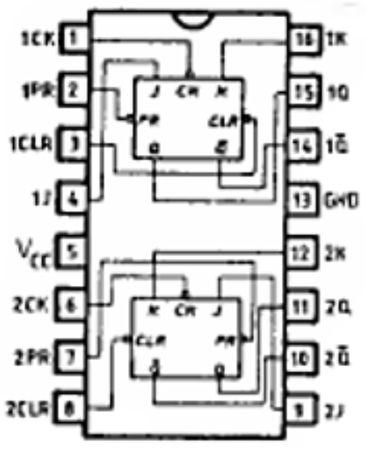
β 7475 (CDB 475E)
β 5475 (CDB 475EM)



PACKAGE MP-117

DUAL J-K FLIP-FLOPS
WITH PRESET AND CLEAR

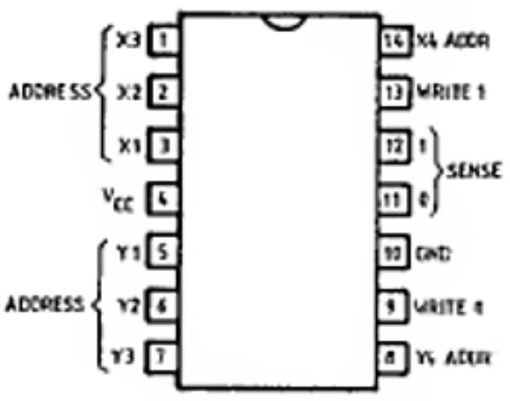
β 7476 (CDB 476E)
β 5476 (CDB 476EM)



PACKAGE MP-117

16-BIT RANDOM-ACCESS
MEMORIES

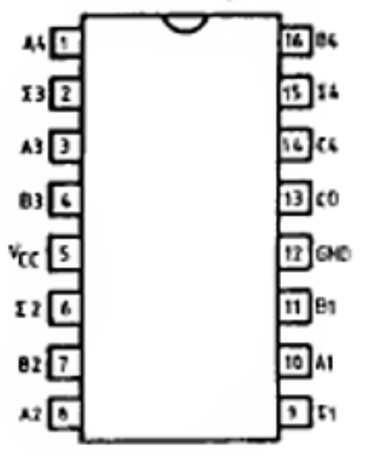
β 7481 (CDB 481E)
β 5481 (CDB 481EM)



PACKAGE TO-116

4-BIT BINARY FULL ADDERS
WITH FAST CARRY

β 7483 (CDB 483E)
β 5483 (CDB 483EM)



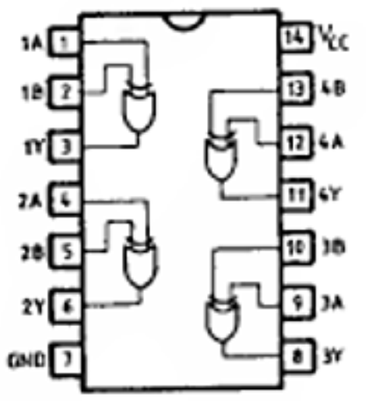
PACKAGE MP-117

QUAD 2-INPUT
EXCLUSIVE-OR GATES

Function : Y = A ⊕ B

β 74LS86

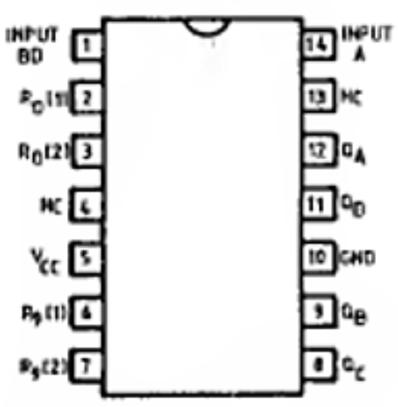
β 7486 (CDB 486E)
β 5486 (CDB 486EM)



PACKAGE TO-116

DECADE COUNTERS
(DIVIDE-BY-2 AND BY-5)

β 7490 (CDB 490E)
β 5490 (CDB 490EM)

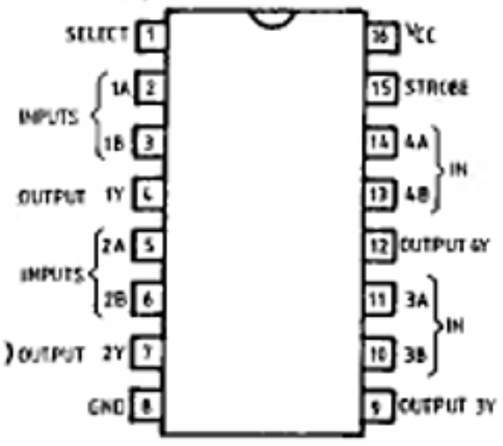


PACKAGE TO-116

QUAD 2-TO-1 DATA MULTIPLEXERS WITH DIRECT DATA OUTPUTS

β 74LS157

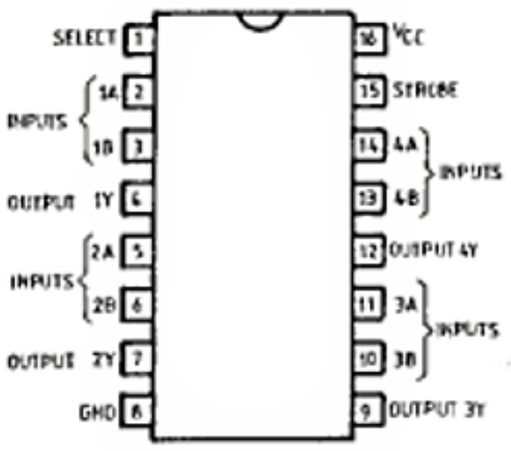
β 74157 (CDB 4157E)
β 54157 (CDB 4157EM)



PACKAGE MP-117

QUAD 2-TO-1 LINE DATA MULTIPLEXERS WITH INVERTED DATA OUTPUTS

β 74LS158



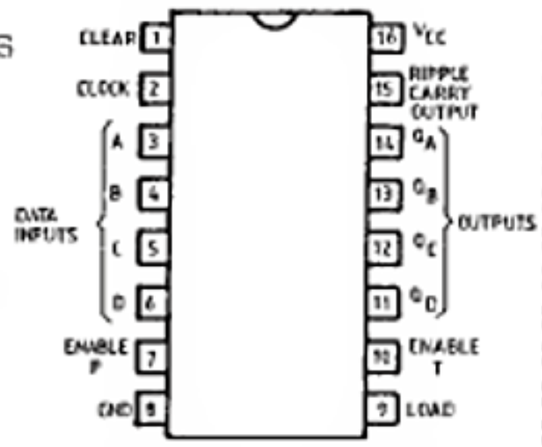
PACKAGE MP-117

SYNCHRONOUS 4-BIT COUNTERS
= WITH DIRECT CLEAR

β 74LS160 (DECADE)
β 74LS161 (BINARY)

= WITH SYNCHRONOUS CLEAR

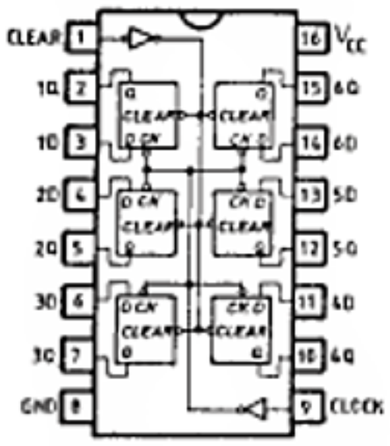
β 74LS162 (DECADE)
β 54LS163 (BINARY)



PACKAGE MP-117

HEX D-TYPE FLIP-FLOPS
(SINGLE RAIL OUTPUTS AND DIRECT CLEAR)

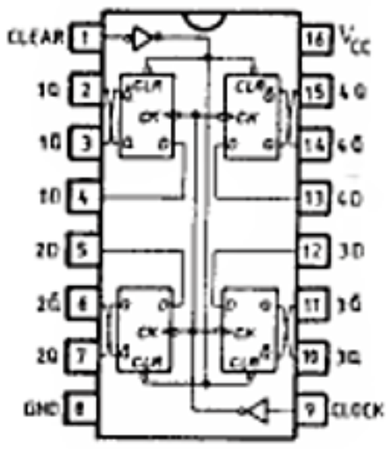
β 74LS174



PACKAGE MP-117

QUAD D-TYPE FLIP-FLOPS
(COMPLEMENTARY OUTPUTS AND DIRECT CLEAR)

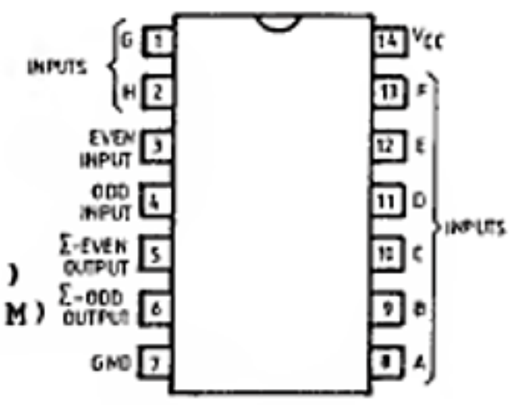
β 74LS175



PACKAGE MP-117

8-BIT ODD/EVEN PARITY GENERATORS / CHECKERS

β 74180 (CDB 4180E)
β 54180 (CDB 4180EM)



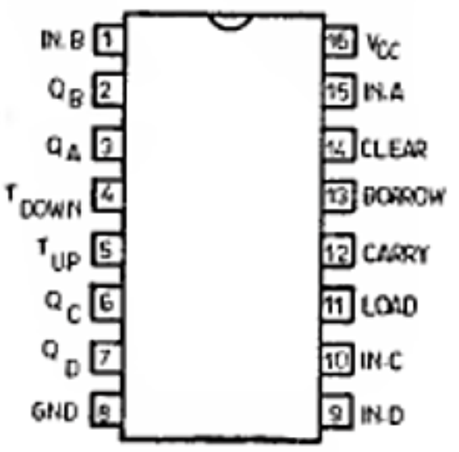
PACKAGE TO-116

SYNCHRONOUS UP/DOWN DUAL CLOCK COUNTERS WITH CLEAR
= DECADE COUNTERS

β 74192 (CDB 4192E)
β 54192 (CDB 4192EM)

= BINARY COUNTERS

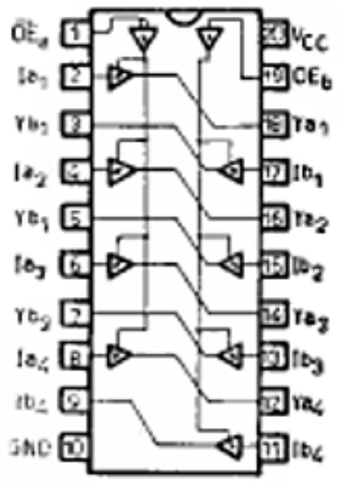
β 74193 (CDB 4193E)
β 54193 (CDB 4193EM)



PACKAGE MP-117

OCTAL NON-INVERTING BUS DRIVER

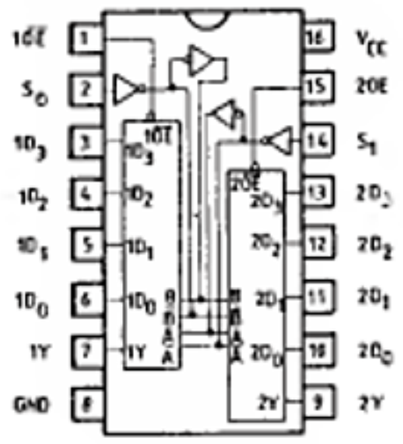
β 74LS241



PACKAGE DIL-20

DUAL 4-TO-1 LINE DATA MULTIPLEXERS WITH DIRECT 3-STATE OUTPUTS

β 74LS253



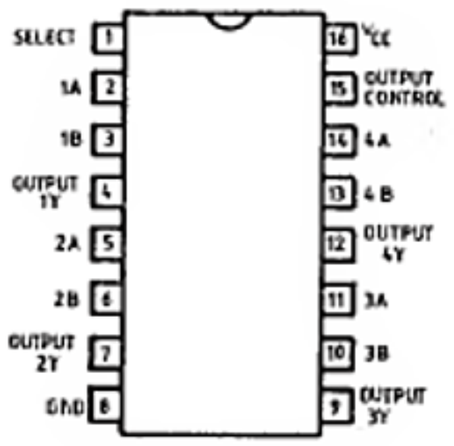
PACKAGE MP-117

QUAD 2-TO-1 DATA MULTIPLEXERS, 3-STATE
= DIRECT OUTPUTS

β 74LS257

= INVERTED OUTPUTS

β 74LS258.

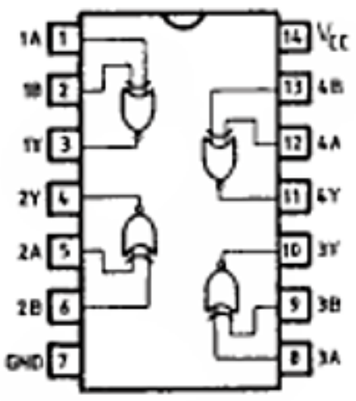


PACKAGE MP-117

QUAD 2-INPUT EX-NOR GATES WITH OPEN-COLLECTOR

Function : $Y = \overline{A \oplus B}$

β 74LS266

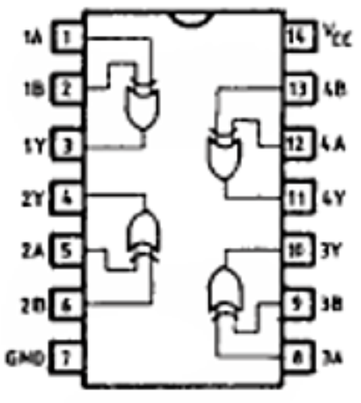


PACKAGE TO-116

QUAD 2-INPUT EXCLUSIVE-OR GATES

Function : $Y = A \oplus B$

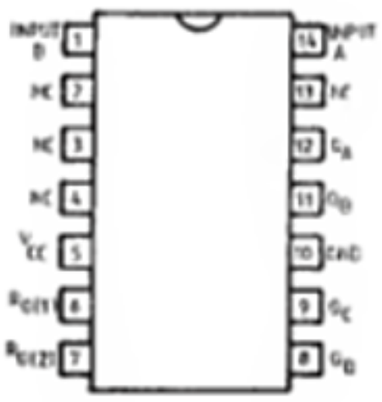
β 74LS386



PACKAGE TO-116

DIVIDE-BY-12 COUNTERS
(DIVIDE-BY-2 AND BY-6)

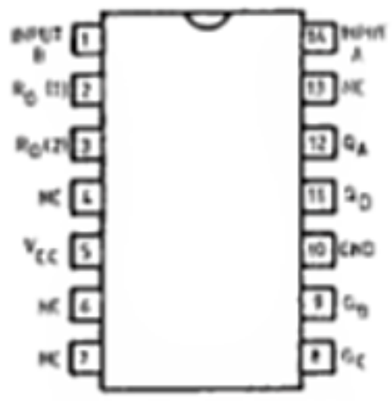
β 7492 (CDB 492E)
β 5492 (CDB 492EM)



PACKAGE TO-116

4-BIT BINARY COUNTERS
(DIVIDE-BY-2 AND BY-8)

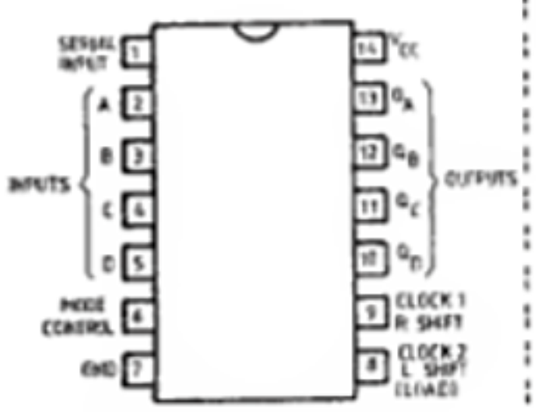
β 7493 (CDB 493E)
β 5493 (CDB 493EM)



PACKAGE TO-116

4-BIT SHIFT REGISTERS
(PARALLEL IN/OUT, OR
SHIFT L/R SERIAL IN)

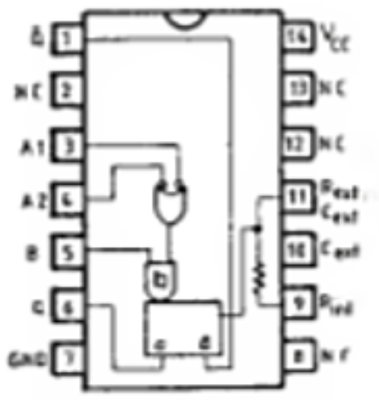
β 7495 (CDB 495E)
β 5495 (CDB 495EM)



PACKAGE TO-116

MONOSTABILE ICs

β 74121 (CDB 4121E)
β 54121 (CDB 4121EM)

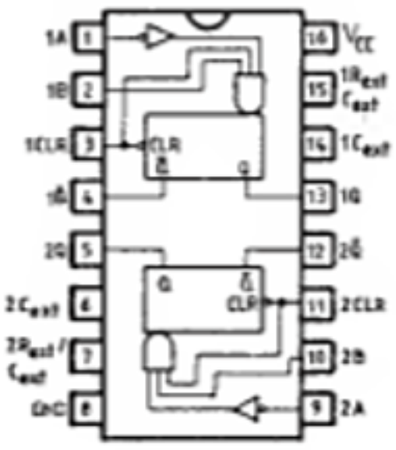


PACKAGE TO-116

DUAL RETRIGGERABLE
MONOSTABILES WITH CLEAR

β 74LS123

β 74123 (CDB 4123E)
β 54123 (CDB 4123EM)



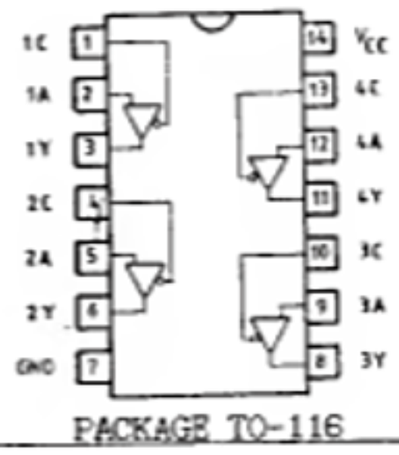
PACKAGE MP-117

QUAD 3-STATE BUFFERS
(INVERTED HI-Z CONTROL)

Function : Y = A

β 74LS125

Output is disabled
when C is HIGH



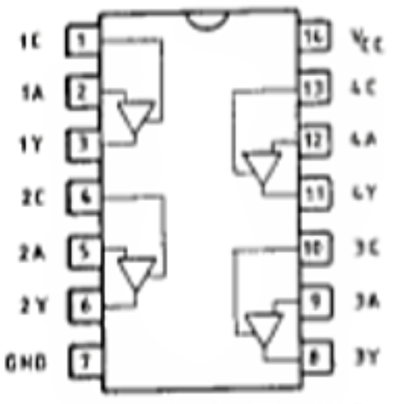
PACKAGE TO-116

QUAD 3-STATE BUFFERS
(DIRECT HI-Z CONTROL)

Function : Y = A

β 74LS126

Output is disabled
when C is LOW.

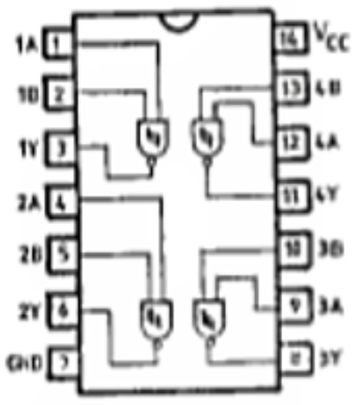


PACKAGE TO-116

QUAD 2-INPUT NAND
SCHMITT-TRIGGERS

Function : $Y = \overline{A \cdot B}$

β 74LS132

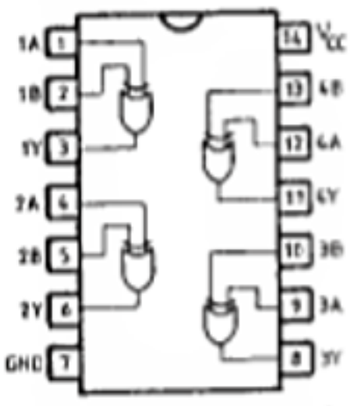


PACKAGE TO-116

QUAD 2-INPUT EX-OR GATES
WITH OPEN COLLECTOR

Function : $Y = A \oplus B$

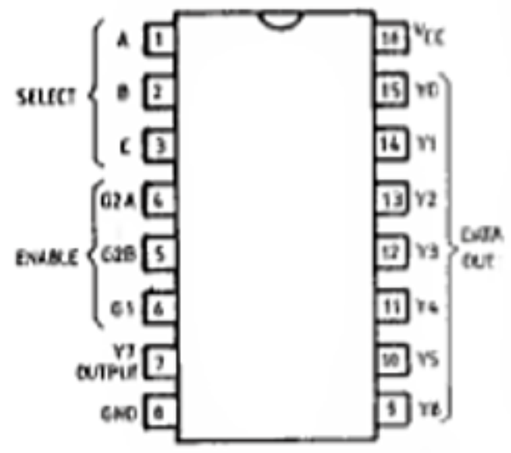
β 74LS136



PACKAGE TO-116

3-TO-8 LINE DECODERS /
MULTIPLEXERS

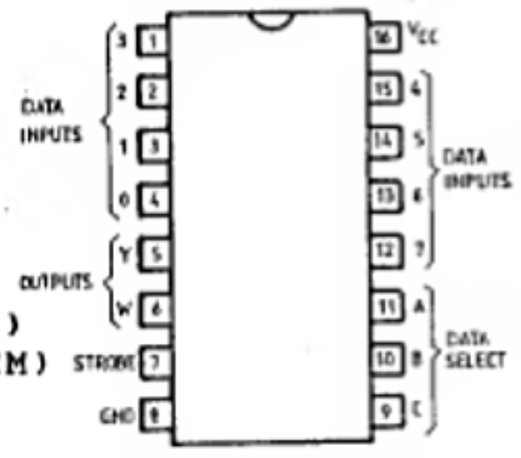
β 74LS138



PACKAGE MP-117

1-OF-8 DATA SELECTORS /
MULTIPLEXERS

β 74151 (CDB 4151E)
β 54151 (CDB 4151EM)

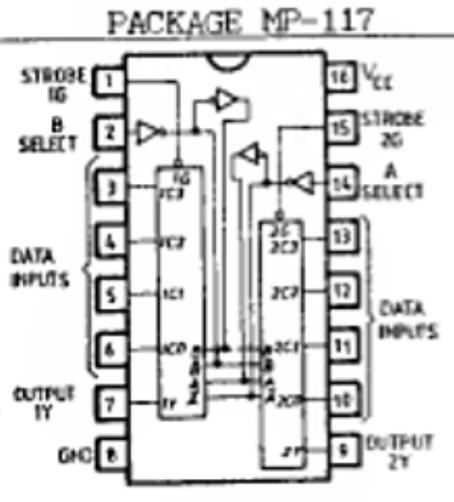


PACKAGE MP-117

DUAL 4-TO-1 LINE DATA
SELECTORS / MULTIPLEXERS

β 74LS153

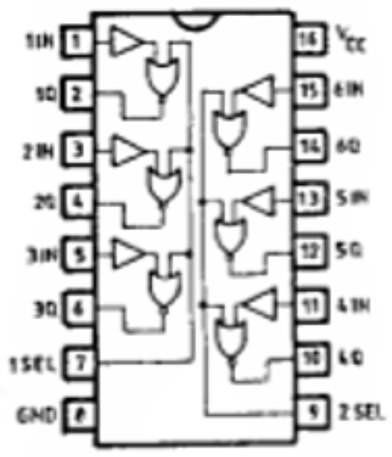
β 74153 (CDB 4153E)
β 54153 (CDB 4153EM)



PACKAGE MP-117

HEX UNIFIED
BUS RECEIVERS

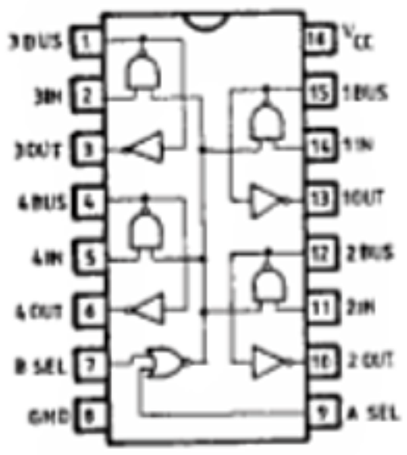
β 7837 (CDB 837E)
β 5837 (CDB 837EM)



PACKAGE MP-117

QUAD UNIFIED
BUS TRANSCEIVERS

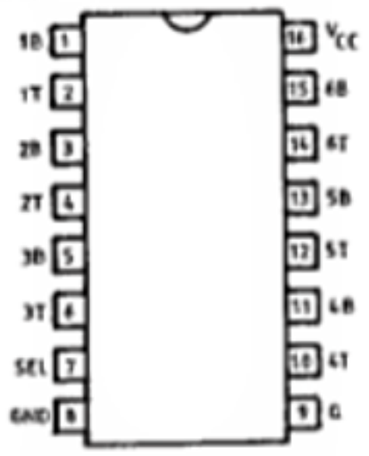
β 7838 (CDB 838E)
β 5838 (CDB 838EM)



PACKAGE MP-117

6-BIT LATCHED COMPARATOR
WITH OPEN COLLECTOR

β 78136 (CDB 8136E)



PACKAGE MP-117

Specifications

Family	Operating Temperature Range	Power Supply range
FZH 101...FZH 171	0 °C ... + 70 °C	13.5 V ... 17.0 V
FZH 105...FZH 175	-25 °C ... + 85 °C	13.5 V ... 17.0 V

Basic Characteristics per NAND Gate @ V_{CC} = 15 V , T_A = 25 °C

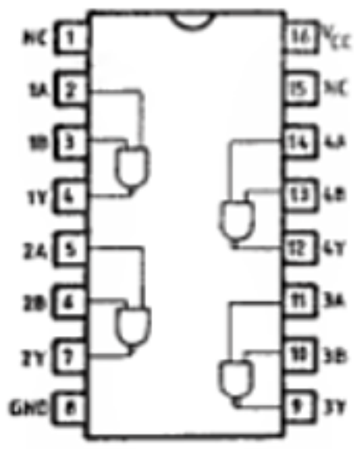
Parameter	Value	Unit
V_{IH} min	7.5	V
V_{IL} max	4.5	V
I_{IH} max	1.0	uA
- I_{IL} max	1.8	mA
V_{OL} max	1.7	V
V_{OH} min	12.0	V
I_{OL} max	18	mA
- I_{OH} max	0.1	mA
- I_{OS} min	15	mA
- I_{OS} max	60	mA
I_{CC} typ @ V_{OL}	3.0	mA
I_{CC} typ @ V_{OH}	1.0	mA
P_d medium	30	mW
t_{pLH} typ (Note 1)	175	ns
t_{pHL} typ (Note 1)	175	ns

Note 1: The propagation delay time and the noise immunity can be increased by connecting an external capacitor between "N" pin and the output "Y" of the same gate.

QUAD 2-INPUT NAND GATES

Function : $Y = \overline{A \cdot B}$

FZH 101
FZH 105

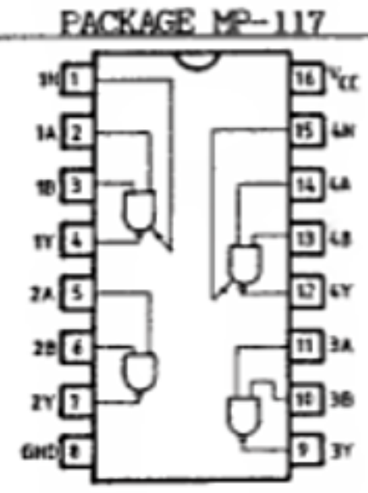


PACKAGE MP-117

QUAD 2-INPUT NAND GATES WITH NOISE-FILTER INPUT

Function : $Y = \overline{A \cdot B}$

FZH 111
FZH 115

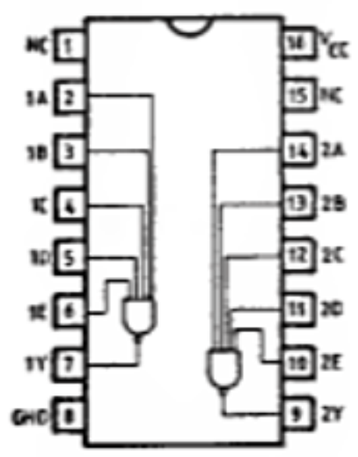


PACKAGE MP-117

DUAL 5-INPUT NAND GATES

Function : $Y = \overline{A.B.C.D.E}$

FZH 121
FZH 125

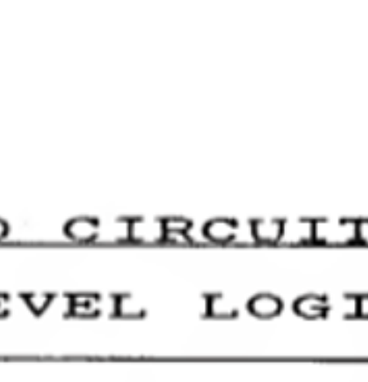


PACKAGE MP-117

DUAL 5-INPUT NAND GATES WITH NOISE-FILTER INPUT

Function : $Y = \overline{A.B.C.D.E}$

FZH 131
FZH 135

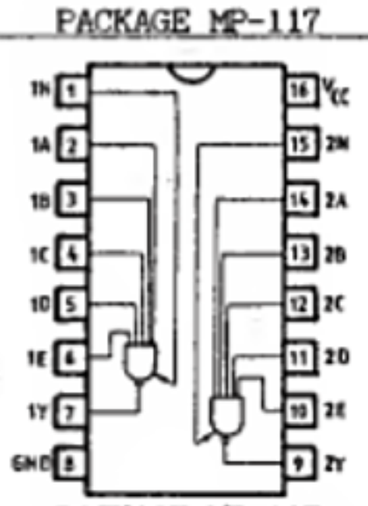


PACKAGE MP-117

DUAL 5-INPUT NAND BUFFERS (I_{OL} max=54mA) WITH N.F.I.

Function : $Y = \overline{A.B.C.D.E}$

FZH 141
FZH 145



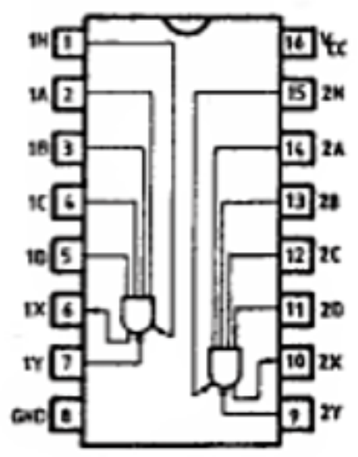
PACKAGE MP-117

DUAL EXPANDABLE 4-INPUT NAND GATES WITH N.F. INPUT

Function : $Y = \overline{A.B.C.D.X}$

FZH 171
FZH 175

To build extended inputs, connect external diodes with the anode to the X input.



PACKAGE MP-117

S I L I C O N D I O D E S

Small signal, References, Microwave _____ page 36

Small signal, Microwave _____ page 37

Small signal, Microwave _____ page 37

Zener _____ page 38

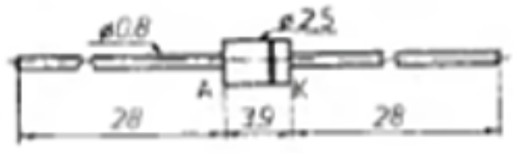
Suppressor _____ page 41

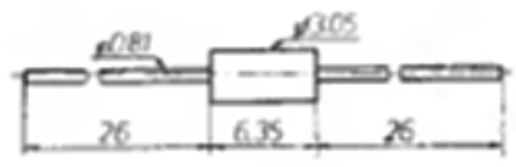
Standard Rectifiers _____ page 42

Fast Recovery _____ page 49

Controlled Avalanche _____ page 52

Power Schottky _____ page 53





CASES: DO-35 DO-41 F-126 (White band near cathode)

HIGH SPEED SWITCHING DIODES

Case DO-35

TYPE	V_R min. (V)	I_F max. (mA)	V_F / I_F max. (V)/(mA)	I_{FSM} (A)	C_{tot} max. (pF)	t_{rr} max. (ns)
1N 4148	75	200	1 / 10	2	4	4
1N 4149	75	200	1 / 10	2	2	4
1N 4151	50	200	1 / 50	2	2	2
1N 4154	25	200	1 / 30	2	4	4
1N 4446	75	200	1 / 20	2	4	4
1N 4447	75	200	1 / 20	2	2	4
1N 4448	75	200	1 /100	2	4	4
1N 4449	75	200	1 / 30	2	2	4
1N 4454	50	200	1 / 10	2	2	2
BAY 93	20	150	1 / 10	2	4	15

AVALANCHE DIODES FOR TELEPHONY

Case DO-35

BAW 21	70	400	1 /200	6	35	50
BAX 12	90	400	1 /200	6	35	50

BAND SWITCHING DIODES

Case DO-35

TYPE	V_R min. (V)	I_F max. (mA)	V_F / I_F max. (V)/(mA)	r_f max. ohms	C_{tot} max. (pF)	@ V_R (V)
BA 243	20	100	1 /100	1	2	15
BA 244	20	100	1 /100	0.7	2	15

ULTRA-LOW LEACKAGE DIODES

Case DO-35

TYPE	V_R min. (V)	I_F max. (mA)	V_F / I_F max. (V)/(mA)	I_R max. (pA)	@ V_R (V)	C_{tot} max. (pF)
DP 450	20	50	1 / 10	5	5.0	1.5
DP 451	20	50	1 / 10	10	5.0	1.5

VARIABLE CAPACITANCE DIODES

Case DO-35

TYPE	V_R min. (V)	C_{tot} @ f=1MHz & min.-max. (pF)	V_R (V)	C_{tot} RATIO min.-max.	@ (V/V)	r_s max. ohms
BB 125	30	2 -3.2	25	4 - 6	3/25	0.8
BB 125A	30	2 -2.35	25	4 - 6	3/25	0.8
BB 125B	30	2.25-2.65	25	4 - 6	3/25	0.8
BB 125C	30	2.5-3.2	25	4 - 6	3/25	0.8
BB 126	30	2 - 3	25	4 - 6	3/25	1.2
BB 139	30	26 - 32	3	5 -6.5	3/25	0.5
β 310	12	16 - 28	4	1.6-2.25	4/ 9	
β 410	12	7.5-11.5	4	1.6-	4/ 9	

400 mW SILICON SCHOTTKY BARRIER DIODES

CASE DO-35

TYPE	PIV (V)	V_F @ I_F max (V)	(I_F (mA)	V_F @ I_F max (V)	(I_F (mA)	I_R @ V max (uA)	(V)	C @ 1MHz (pF)
SD101A	60	0.41	1	1.00	15	0.2	50	2.0
SD101B	50	0.40	1	0.95	15	0.2	40	2.1
SD101C	40	0.39	1	0.90	15	0.2	30	2.2
$ SD103A	40	0.37	20	0.60	200	5.0	30	50.0
$ SD103B	30	0.37	20	0.60	200	5.0	20	50.0
$ SD103C	20	0.37	20	0.60	200	5.0	10	50.0
$ SD104A	10	0.45	1	0.60	10	0.3	1	1.0
$ SD104B	5	0.45	1	0.60	10	0.3	1	1.0
$ SD104C	10	0.45	1	0.60	10	0.3	1	1.2
$ SD104D	5	0.45	1	0.60	10	0.3	1	1.2
$ SD104E	10	0.425	1	0.55	10	0.3	1	1.5
$ SD104F	5	0.425	1	0.55	10	0.3	1	1.5

$ Preliminary data

GENERAL APPLICATION DIODES

Case DO-35

TYPE	V_R min. (V)	I_F max. (mA)	V_F / I_F max. (V)/(mA)	I_R max. (nA)	r_f max. ohms	t_{rr} max. (ns)
BA 170	20	150	1 / 80	100	0.5	100
BA 171	30	150	1 / 80	100	0.5	100
BA 172	50	150	1 / 80	100	0.5	100

TEMPERATURE COMPENSATED REFERENCES

Case DO-35

TYPE	V_Z typ. (V)	r_{ZT} max. ohms	TEST TEMP. (°C)	V_Z max. (mV)	MAX TEMP. COEFF. (x10^{-4}/°C)
BZV 43	6.2	20	0/25/100	62	1
BZV 44	6.2	20	0/25/100	31	0.5
BZV 45	6.2	20	0/25/100	12	0.2
ZTC 33	33	25			-1/ +0.5

THERMOCONTROLLED VOLTAGE REGULATORS

Cases F-126 / DO-41

TYPE	V_Z typ. (V)	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. (ohms)	VOLTAGE DRIFT (mV/°C)
DL 5V6A	5.6	5.3- 5.9	7.5	75	2.5- 4
DL 5V6B	5.6	5.3- 5.9	7.5	75	3.4-5.5
DL 6V2A	6.2	5.7- 6.6	7.5	75	3 -4.5
DL 6V2B	6.2	5.7- 6.6	7.5	75	3.75- 6
DL 6V8A	6.8	6.4- 7.2	7.5	75	3.3-4.8
DL 6V8B	6.8	6.4- 7.2	7.5	75	4.4-6.5

REFERENCE DIODES

Case F-126

TYPE	I_{FM} # (mA)	V_F @ I_F min.-max. (V)	(I_F (mA)	r_f max. (ohms)
DRD 1	250	0.40-0.50	0.1	680
		0.52-0.63	1	65
		0.56-0.66	2	34
		0.61-0.71	5	13
		0.65-0.74	10	6.7
		0.75-0.85	100	0.7
		0.80-0.91	250	0.43
DRD 2	250	0.80-1.00	0.1	1300
		1.05-1.25	1	135
		1.11-1.33	2	68
		1.19-1.42	5	26
		1.25-1.50	10	13
		1.50-1.75	100	2
		1.60-1.90	250	1.1
DRD 3	250	1.22-1.42	0.1	2250
		1.62-1.83	1	205
		1.74-1.94	2	100
		1.87-2.08	5	42
		1.98-2.18	10	21
		2.30-2.60	100	3.5
		2.50-2.80	250	2.5
DRD 4	250	1.50-1.90	0.1	3100
		2.07-2.37	1	275
		2.23-2.50	2	180
		2.45-2.67	5	55
		2.60-2.80	10	27
		3.00-3.30	100	4.5
		3.20-3.50	250	3.5

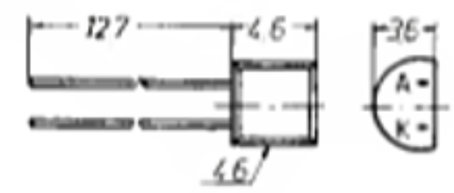
T_{VJ}=25°C

BANEASA S.A.

SMALL SIGNAL, MICROWAVE

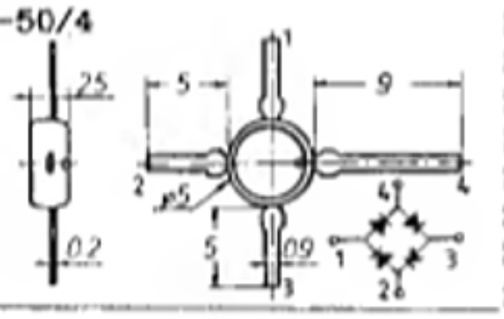
SCHOTTKY DIODES

TYPE	V_R @ I_R=10uA min. (V)	I_R @ V_R min. (nA)	V_F @ I_F max. (V)	I_F (mA)	V_F @ I_F max. (V)	I_F (mA)	C_o @ V_R=0 & f max. (pF)	f (MHz)	CASE STYLE
BS 05155Y	5	100	0.4	1	0.5	10	1.5	1	TO-92s
BS 10155Y	10	100	0.4	1	0.5	10	1.5	1	
BS 10106Y	10	100	0.4	1	0.6	10	1	1	
BS 15106Y	15	100	0.4	1	0.6	10	1	1	
BS 20107Y	20	100	0.4	1	0.7	10	1	1	



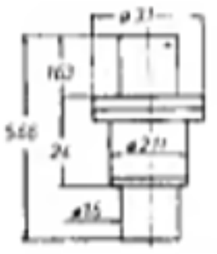
SCHOTTKY DIODE RINGS

TYPE	V_F @ I_F max. (V)	I_F (mA)	$\triangle V_F$ @ I_F max. (mV)	I_F (mA)	$\triangle C$ @ I_F & f max. (pF)	I_F (mA)	f (MHz)	WORK FRQ. max. (GHz)	CASE STYLE
BS 20107 Q	1.4	10	20	10	0.2	0	1	3.50	TO-50/4
BS 30056 Q	1.2	10	10	10	0.1	0	1	3.50	



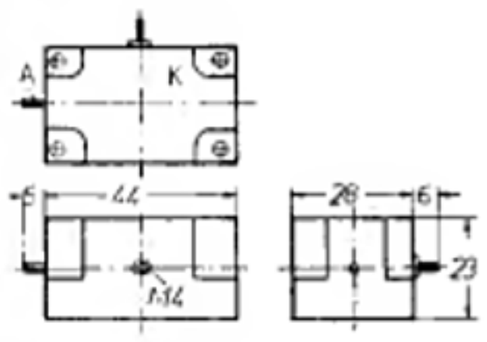
BARITT DIODES

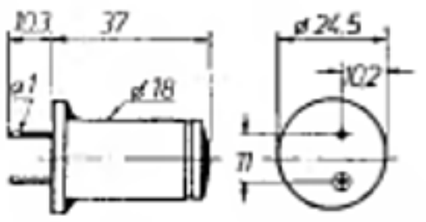
TYPE	P_{out} min. (mW)	V_D @ I_R=0.1mA max. (V)	I_R @ V_R=0.8V_P max. (uA)	C_D @ V_P & f=1MHz max. (pF)	I_o typ. (mA)	f_o min.-max. (GHz)	EFFICIENCY (%)	CASE STYLE
BX 011Y	1	40	10	1.2	15	8 - 12	0.05	F-27d1
BX 051Y	5	55	10	1.2	25	8 - 12	0.20	
BX 101Y	10	75	10	1.2	35	8 - 12	0.50	
BX 012Y	1	40	10	1.2	15	8 - 12	0.05	F-27d2
BX 052Y	5	55	10	1.2	25	8 - 12	0.20	
BX 102Y	10	75	10	1.2	35	8 - 12	0.50	



SELF-OSCILLATING MIXERS

TYPE	P_{out} min. (mW)	V_L min. (V)	I_L max. (mA)	NOISE V. min. (uV)	S_o min. (dB)	f_o min.-max. (GHz)	CASE STYLE
TDG 034011	1 - 3	40	5 - 20	100	70	8.5 - 9	SOM-1
TDG 055011	3 - 5	50	5 - 20	100	75	8.5 - 9	
TDG 107011	5 -10	70	5 - 20	100	80	8.5 - 9	
TDM 012011	0.1	20	5 - 20	80	50	10.5 - 12	SOM-2
TDM 032511	0.3	25	5 - 20	80	45	10.5 - 12	
TDM 033011	0.3	30	5 - 20	80	50	10.5 - 12	
TDM 052511	0.5	25	5 - 20	80	50	10.5 - 12	
TDM 053011	0.5	30	5 - 20	80	50	10.5 - 12	
TDM 102811	1	28	5 - 20	80	70	10.5 - 12	
TDM 103011	1	30	5 - 20	80	70	10.5 - 12	
TDM 103511	1	35	5 - 20	80	70	10,5 - 12	





BANEASA S.A.

0.5W @ T_A=25°C ZENER DIODES

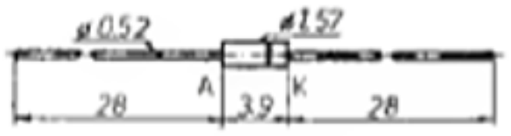
Case DO-35

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
DZ 2V7	2.5- 2.9	5	83	160	-9/-4
DZ 3	2.8- 3.2	5	95	140	-9/-3
DZ 3V3	3.1- 3.5	5	95	130	-8/-3
DZ 3V6	3.4- 3.8	5	95	120	-8/-3
DZ 3V9	3.7- 4.1	5	95	110	-7/-3
DZ 4V3	4.0- 4.6	5	95	100	-6/-1
DZ 4V7	4.4- 5.0	5	78	90	-5/+2
DZ 5V1	4.8- 5.0	5	60	80	-3/+4
DZ 5V6	5.2- 6.0	5	40	70	-2/+6
DZ 6V2	5.8- 6.6	5	10	64	-1/+7
DZ 6V8	6.4- 7.2	5	8	58	2/ 7
DZ 7V5	7.0- 7.9	5	7	53	3/ 7
DZ 8V2	7.7- 8.7	5	7	47	4/ 7
DZ 9V1	8.5- 9.6	5	10	43	5/ 8
DZ 10	9.4-10.6	5	15	40	5/ 8
DZ 11	10.4-11.6	5	20	36	5/ 9
DZ 12	11.4-12.7	5	20	32	6/ 9
DZ 13	12.4-14.1	5	25	29	7/ 9
DZ 15	13.8-15.6	5	30	27	7/ 9
DZ 16	15.3-17.1	5	40	24	8/9.5
DZ 18	16.8-19.1	5	50	21	8/9.5
DZ 20	18.8-21.2	5	50	20	8/10
DZ 22	20.8-23.3	5	55	18	8/10
DZ 24	22.8-25.6	5	80	16	8/10
DZ 27	25.1-28.9	5	80	14	8/10
DZ 30	28 - 32	5	80	13	8/10
DZ 33	31 - 35	5	80	12	8/10
DZ 36	34 - 38	5	90	11	8/10
DZ 39	37 - 41	5	90	10	10/12
DZ 43	40 - 46	5	100	9	10/12
DZ 47	44 - 50	5	100	8	10/12
DZ 51	48 - 54	5	100	8	10/12

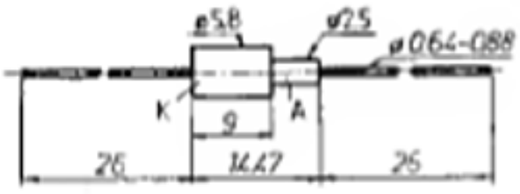
1.0W @ T_A=25°C ZENER DIODES

Case DO-13

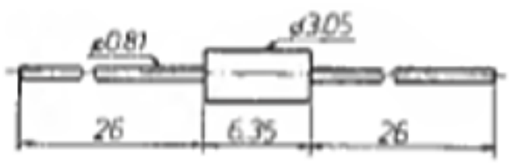
1N 3016B	6.4- 7.2	37	3.5	140	2/ 6
1N 3017B	7.0- 7.9	34	4	130	3/ 7
1N 3018B	7.7- 8.7	31	4.5	110	3.5/7.5
1N 3019B	8.5- 9.6	28	5	100	4/ 8
1N 3020B	9.4-10.6	25	7	94	4/ 8
1N 3021B	10.4-11.6	23	8	86	4/ 9
1N 3022B	11.4-12.7	21	9	79	4/ 9
1N 3023B	12.4-14.1	19	10	71	4/ 9
1N 3024B	13.8-15.6	17	14	64	5/ 9
1N 3025B	15.3-17.1	15.5	16	59	5/ 9
1N 3026B	16.8-19.1	14	20	52	5/ 9
1N 3027B	18.8-21.2	12.5	22	47	5/ 9
1N 3028B	20.8-23.3	11.5	23	43	5/ 9
1N 3029B	22.8-25.6	10.5	25	39	5/ 9
1N 3030B	25.1-28.9	9.5	35	35	5/ 9
1N 3031B	28 - 32	8.5	40	31	5/ 9
1N 3032B	31 - 35	7.5	45	29	5/ 9
1N 3033B	34 - 38	7	50	26	6/10
1N 3034B	37 - 41	6.5	60	24	6/10
1N 3035B	40 - 46	6	70	22	6/10
1N 3036B	44 - 50	5.5	80	20	8/10
1N 3037B	48 - 54	5	95	19	8/10
1N 3038B	52 - 60	4.5	110	17	9/10
1N 3039B	58 - 66	4	125	15	9/10
1N 3040B	64 - 72	3.7	150	14	9/10
1N 3041B	70 - 79	3.3	175	13	9/10
1N 3042B	77 - 87	3	200	12	9/10
1N 3043B	85 - 96	2.8	250	10	9/10
1N 3044B	94 -106	2.5	350	9.4	9/10
1N 3045B	104 -116	2.3	450	8.6	9/11
1N 3046B	114 -127	2	550	7.8	9/11
1N 3047B	124 -141	1.9	700	7	9/11
1N 3048B	138 -156	1.7	1.0k	6.4	9/11
1N 3049B	153 -171	1.6	1.1k	5.8	9/11
1N 3050B	168 -191	1.4	1.2k	5.2	10/11
1N 3051B	188 -212	1.2	1.5k	4.7	10/11



CASE : DO-35



CASE : DO-13

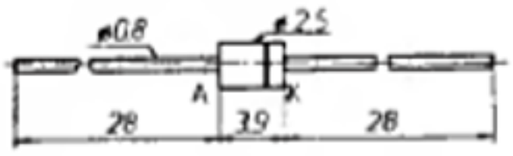


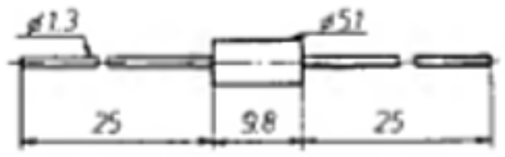
CASE : F-126 (White band near K.)

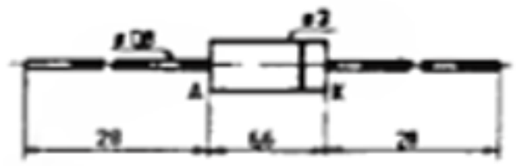
1.0W @ T_A=25°C ZENER DIODES

Case F-126

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
PL 2V7Z	2.5- 2.9	80	12	-	-
PL 3Z	2.8- 3.2	80	12	-	-
PL 3V3Z	3.1- 3.5	80	10	285	-6
PL 3V6Z	3.4- 3.8	80	10	260	-5.5
PL 3V9Z	3.7- 4.1	80	7	240	-5
PL 4V3Z	4.0- 4.6	80	7	215	-4
PL 4V7Z	4.4- 5.0	80	7	200	-2
PL 5V1Z	4.8- 5.4	80	5	185	1
PL 5V6Z	5.2- 6.0	80	2	165	2.5
PL 6V2Z	5.8- 6.6	80	2	150	3.2
PL 6V8Z	6.4- 7.2	80	2	140	4
PL 7V5Z	7.0- 7.9	50	2	130	4.5
PL 8V2Z	7.7- 8.7	50	2	110	4.8
PL 9V1Z	8.5- 9.6	50	2	100	5.1
PL 10Z	9.4-10.6	50	4	94	5.5
PL 11Z	10.4-11.6	50	7	86	6
PL 12Z	11.4-12.7	50	7	79	6.5
PL 13Z	12.4-14.1	50	10	71	6.5
PL 15Z	13.8-15.6	50	10	64	7
PL 16Z	15.3-17.1	25	15	59	7
PL 18Z	16.8-19.1	25	15	52	7.5
PL 20Z	18.8-21.2	25	15	47	7.5
PL 22Z	20.8-23.3	25	15	43	8
PL 24Z	22.8-25.6	25	15	39	8
PL 27Z	25.1-28.9	25	15	35	8.5
PL 30Z	28 - 32	25	15	31	8.5
PL 33Z	31 - 35	25	15	29	8.5
PL 36Z	34 - 38	10	40	26	8.5
PL 39Z	37 - 41	10	40	24	9
PL 43Z	40 - 46	10	45	22	9
PL 47Z	44 - 50	10	45	20	9
PL 51Z	44 - 54	10	60	19	9
PL 56Z	52 - 60	10	60	17	9
PL 62Z	58 - 66	10	80	15	9
PL 68Z	64 - 72	10	80	14	9
PL 75Z	70 - 79	10	100	13	9
PL 82Z	77 - 87	10	100	12	9
PL 91Z	85 - 96	5	200	10	9
PL 100Z	94 -106	5	200	9.4	9.5
PL 110Z	104-116	5	250	8.6	9.5
PL 120Z	114-127	5	250	7.8	9.5
PL 130Z	124-141	5	300	7	9.5
PL 150Z	138-156	5	300	6.4	9.5
PL 160Z	153-171	5	350	5.8	9.5
PL 180Z	168-191	5	350	5.3	9.5
PL 200Z	188-212	5	350	5	10







CASES : DO-41 DO-27A DO-27 MOD

1.3W @ T_A=25°C ZENER DIODES

Case DO-41

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
ZP 3V9	3.7- 4.1	100	7	290	-7/+2
ZP 4V3	4.0- 4.6	100	7	260	-7/+3
ZP 4V7	4.4- 5.0	100	7	235	-7/+4
ZP 5V1	4.8- 5.4	100	5	215	-6/+5
ZP 5V6	5.2- 6.0	100	2	193	-3/+5
ZP 6V2	5.8- 6.6	100	2	183	-1/+6
ZP 6V8	6.4- 7.2	100	2	157	0/ 7
ZP 7V5	7.0- 7.9	100	2	143	0/ 7
ZP 8V2	7.7- 8.7	100	2	127	3/ 8
ZP 9V1	8.5- 9.6	50	4	117	3/ 8
ZP 10	9.4-10.6	50	4	105	5/ 9
ZP 11	10.4-11.6	50	7	94	5/10
ZP 12	11.4-12.7	50	7	85	5/10
ZP 13	12.4-14.1	50	9	78	5/10
ZP 15	13.8-15.6	50	9	70	5/10
ZP 16	15.3-17.1	25	10	63	7/11
ZP 18	16.8-19.1	25	11	57	7/11
ZP 20	18.8-21.2	25	12	52	7/11
ZP 22	20.8-23.3	25	13	48	7/11
ZP 24	22.8-25.6	25	14	42	7/12
ZP 27	25.1-28.9	25	15	38	7/12
ZP 30	28 - 32	25	20	35	7/12
ZP 33	31 - 35	25	20	31	7/12
ZP 36	34 - 38	10	60	29	7/12
ZP 39	37 - 41	10	60	26	8/12
ZP 43	40 - 46	10	80	24	8/13
ZP 47	44 - 50	10	80	22	8/13
ZP 51	48 - 54	10	100	20	8/13
ZP 56	52 - 60	10	100	18	8/13
$ ZP 62	58 - 66	10	130	16	8/13
$ ZP 68	64 - 72	10	130	14	8/13
$ ZP 75	70 - 79	10	160	13	8/13
$ ZP 82	77 - 87	10	160	12	8/13
$ ZP 91	85 - 96	5	250	11	9/13
$ ZP 100	94 -106	5	250	10	9/13

$ Preliminary data

5W @ T_T=25°C ZENER DIODES

Case DO-27A

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
5DZ 5V1	4.8- 5.4	240	1.5	925	1
5DZ 5V6	5.2- 6.0	220	1	830	2.5
5DZ 6V2	5.8- 6.6	200	1	750	3.2
5DZ 6V8	6.4- 7.2	175	1	690	4
5DZ 7V5	7.0- 7.9	175	1.5	630	4.5
5DZ 8V2	7.7- 8.7	150	1.5	570	4.8
5DZ 9V1	8.5- 9.6	150	2	520	5.1
5DZ 10	9.4-10.6	125	2	470	5.5
5DZ 11	10.4-11.6	125	2.5	430	6
5DZ 12	11.4-12.7	100	2.5	390	6.5
5DZ 13	12.4-14.1	100	2.5	350	6.5
5DZ 15	13.8-15.6	75	2.5	320	7
5DZ 16	15.3-17.1	75	2.5	290	7
5DZ 18	16.8-19.1	65	2.5	260	7.5
5DZ 20	18.8-21.2	65	3	235	7.5
5DZ 22	20.8-23.3	50	3.5	215	8
5DZ 24	22.8-25.6	50	3.5	195	8
5DZ 27	25.1-28.9	50	5	170	8.5
5DZ 30	28 - 32	40	8	155	8.5
5DZ 33	31 - 35	40	10	140	8.5
5DZ 36	34 - 38	30	11	130	8.5
5DZ 39	37 - 41	30	14	120	9
5DZ 43	40 - 46	30	20	110	9
5DZ 47	44 - 50	25	25	100	9
5DZ 51	48 - 54	25	27	92	9
5DZ 56	52 - 60	20	35	83	9
5DZ 62	58 - 66	20	42	75	9
5DZ 68	64 - 72	20	44	69	9
5DZ 75	70 - 79	20	45	63	9
5DZ 82	77 - 87	15	65	57	9
5DZ 91	85 - 96	15	75	52	9
5DZ 100	94 -106	12	90	47	9.5
5DZ 110	104 -116	12	125	43	9.5
5DZ 120	114 -127	10	170	39	9.5
5DZ 130	124 -141	10	190	35	9.5
5DZ 150	138 -156	8	330	32	9.5
5DZ 160	153 -171	8	350	29	9.5
5DZ 180	168 -191	5	430	26	9.5
5DZ 200	188 -212	5	480	23	10

20W @ T_C=25°C ZENER DIODES

Case DO-5

20DZ 6V8	6.1- 7.5	730	1	2700	3
20DZ 8V2	7.4- 9.1	610	1.2	2200	4
20DZ 10	9 - 11	500	1.8	1800	5
20DZ 12	10.5-13.5	420	2.4	1540	5.7
20DZ 15	13 -16.5	330	3.9	1250	6.3
20DZ 18	16 -20.5	280	5.7	1000	6.8
20DZ 22	20 -24.5	230	6.9	830	7.3
20DZ 27	24 - 30	180	9	665	7.7
20DZ 33	29 - 36	150	11	555	8
20DZ 39	35 - 43	120	13	465	8.3
20DZ 47	42 - 52	100	16	390	8.6
20DZ 56	50 - 62	90	18	320	8.8
20DZ 68	61 - 75	73	24	265	9
20DZ 82	74 - 91	60	33	220	9.2
20DZ 100	90 -110	50	56	180	9.3
20DZ 120	105 -135	42	76	154	9.4
20DZ 150	130 -165	33	150	125	9.6
20DZ 180	160 -205	28	280	100	9.6

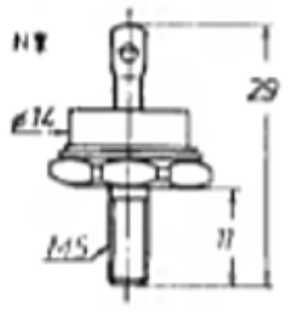
10W @ T_C=25°C ZENER DIODES

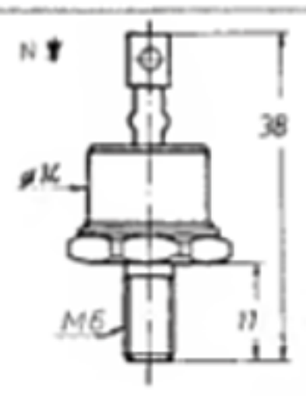
Case TO-220d

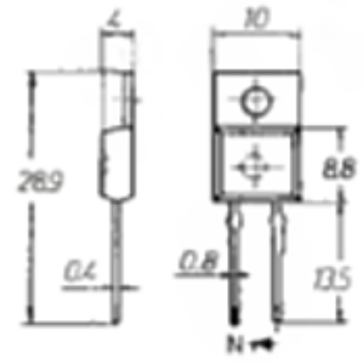
10DZ 12P	10.5-13.5	210	3.2	730	6.5
10DZ 15P	13 -16.5	170	4.5	590	7
10DZ 18P	16 -20.5	140	6	490	7.5
10DZ 22P	20 -24.5	115	8.5	410	8
10DZ 27P	24 - 30	95	11	330	8.5
10DZ 33P	29 - 36	75	17	270	8.5
10DZ 39P	35 - 43	65	21	230	9
10DZ 47P	42 - 52	55	28	190	9
10DZ 56P	50 - 62	45	38	160	9
10DZ 68P	61 - 75	37	52	140	9
10DZ 82P	74 - 91	30	72	110	9
10DZ 100P	90 -110	25	96	90	9
10DZ 120P	105 -135	20	135	70	9.5
10DZ 150P	130 -165	17	190	60	9.5
10DZ 180P	160 -205	14	260	50	9.5

ZENER

BANEASA S.A.







CASES: DO-4 DO-5 TO-220d

$ 5W ZENER DIODES

Case DO-27 MOD

(Continued)

TYPE	V_Z (V)	V_Z min.- (V)	@ max.	I_{ZT} (mA)	r_{ZT} max. ohms	I_r (mA)	V_r (V)
1N 5333B	3.3	3.14-	3.47	380	3	300	1
1N 5334B	3.6	3.42-	3.78	350	2.5	150	1
1N 5335B	3.9	3.71-	4.10	320	2	50	1
1N 5336B	4.3	4.09-	4.52	290	2	10	1
1N 5337B	4.7	4.47-	4.94	260	2	5	1
1N 5338B	5.1	4.85-	5.36	240	1.5	1	1
1N 5339B	5.6	5.32-	5.88	220	1	1	2
1N 5340B	6.0	5.70-	6.30	200	1	1	3
1N 5341B	6.2	5.89-	6.51	200	1	1	3
1N 5342B	6.8	6.46-	7.14	175	1	10	5.2
1N 5343B	7.5	7.13-	7.88	175	1.5	10	5.7
1N 5344B	8.2	7.79-	8.61	150	1.5	10	6.2
1N 5345B	8.7	8.27-	9.14	150	2	10	6.6
1N 5346B	9.1	8.65-	9.56	150	2	7.5	6.9
1N 5347B	10.0	9.50-	10.50	125	2	5	7.6
1N 5348B	11.0	10.45-	11.55	125	2.5	5.0	8.4
1N 5349B	12.0	11.40-	12.60	100	2.5	2.0	9.1
1N 5350B	13.0	12.35-	13.65	100	2.5	1.0	19.9
1N 5351B	14.0	13.30-	14.70	100	2.5	1.0	10.6
1N 5352B	15.0	14.25-	15.75	75	2.5	1.0	11.5
1N 5353B	16.0	15.20-	16.00	75	2.5	1.0	12.2
1N 5354B	17.0	16.15-	17.85	70	2.5	0.5	12.9
1N 5355B	18.0	17.10-	18.90	65	2.5	0.5	13.7
1N 5356B	19.0	18.05-	19.95	65	3.0	0.5	14.4
1N 5357B	20.0	19.00-	21.00	65	3.0	0.5	15.2
1N 5358B	22.0	20.90-	23.10	50	3.5	0.5	16.7
1N 5359B	24.0	22.80-	25.20	50	3.5	0.5	18.2
1N 5360B	25.0	23.75-	26.25	50	4.0	0.5	19.0

TYPE	V_Z (V)	V_Z min.- (V)	@ max.	I_{ZT} (mA)	r_{ZT} max. ohms	I_r (mA)	V_r (V)
1N 5361B	27.0	25.65-	28.35	50	5.0	0.5	20.6
1N 5362B	28.0	26.60-	29.40	50	6.0	0.5	21.2
1N 5363B	30.0	28.50-	31.50	40	8.0	0.5	22.8
1N 5364B	33.0	31.35-	34.65	40	10.0	0.5	25.1
1N 5365B	36.0	34.20-	37.80	30	11.0	0.5	27.4
1N 5366B	39.0	37.05-	40.95	30	14.0	0.5	29.7
1N 5367B	43.0	40.85-	45.15	30	20.0	0.5	32.7
1N 5368B	47.0	44.65-	49.35	25	25.0	0.5	35.8
1N 5369B	51.0	48.45-	53.55	25	27.0	0.5	38.8
1N 5370B	56.0	53.20-	58.80	20	35.0	0.5	42.6
1N 5371B	60.0	57.00-	63.00	20	40.0	0.5	45.5
1N 5372B	62.0	58.90-	65.10	20	42.0	0.5	47.1
1N 5373B	68.0	64.60-	71.40	20	44.0	0.5	51.7
1N 5374B	75.0	71.25-	78.75	20	45.0	0.5	56.0
1N 5375B	82.0	77.90-	86.10	15	65.0	0.5	62.2
1N 5376B	87.0	82.65-	91.35	15	75.0	0.5	66.0
1N 5377B	91.0	86.45-	95.55	15	75.0	0.5	69.2
1N 5378B	100.0	95.00-	105.00	12	90.0	0.5	76.0
1N 5379B	110.0	104.50-	115.50	12	125.0	0.5	83.6
1N 5380B	120.0	114.00-	126.00	10	170.0	1.5	91.2
1N 5381B	130.0	123.50-	136.50	10	190.0	0.5	98.8
1N 5382B	140.0	133.00-	147.00	8	230.0	0.5	106.0
1N 5383B	150.0	142.50-	157.50	8	330.0	0.5	114.0
1N 5384B	160.0	152.00-	168.00	8	350.0	0.5	122.0
1N 5385B	170.0	161.50-	178.50	8	380.0	0.5	129.0
1N 5386B	180.0	171.00-	189.00	5	430.0	0.5	137.0
1N 5387B	190.0	180.50-	199.50	5	450.0	0.5	144.0
1N 5388B	200.0	190.00-	210.00	5	480.0	0.5	152.0

Suffix "B" designates a standard tolerance on the nominal zener voltage of ± 5 %
$ Preliminary data.

10W @ T_C=25°C ZENER DIODES

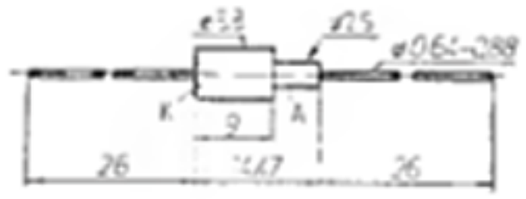
Case DO-4

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
10DZ 6V8	6.1- 7.5	370	1.2	1300	3
10DZ 8	7.4- 9.1	305	1.8	1100	4
10DZ 10	9 - 11	250	2.4	925	5
10DZ 12	10.5-13.5	210	3.2	770	5.7
10DZ 15	13 -16.5	170	4.5	625	6.3
10DZ 18	16 -20.5	140	6	500	6.8
10DZ 22	20 -24.5	115	8.5	415	7.3
10DZ 27	24 - 30	95	11	335	7.7
10DZ 33	29 - 36	75	17	275	8
10DZ 39	35 - 43	65	21	230	8.5
10DZ 47	42 - 52	55	28	195	8.5
10DZ 56	50 - 62	45	38	160	8.8
10DZ 68	61 - 75	37	52	135	9
10DZ 82	74 - 91	30	72	110	9.2
10DZ 100	90 -110	25	96	90	9.3
10DZ 120	105 -135	20	135	77	9.4
10DZ 150	130 -165	17	190	62	9.6
10DZ 180	160 -205	14	260	50	9.6

50W @ T_C=30°C ZENER DIODES

Case DO-5

TYPE	V_Z @ min.-max. (V)	I_{ZT} (mA)	r_{ZT} max. ohms	I_{ZM} (mA)	TEMP. COEFF. 10^{-4}/°C
50DZ 10	9 - 11	1200	0.8	3900	6
50DZ 12	10.5-13.5	1000	1.2	3000	6.5
50DZ 15	13 -16.5	830	1.8	2500	7
50DZ 18	16 -20.5	700	2.4	2200	7.5
50DZ 22	20 -24.5	570	2.7	1900	8
50DZ 27	24 - 30	460	3	1500	8.5
50DZ 33	29 - 36	380	3.5	1300	8.5
50DZ 39	35 - 43	320	4.5	1050	9
50DZ 47	42 - 52	270	5.5	880	9
50DZ 56	50 - 62	220	7	740	9
50DZ 68	61 - 75	180	9	600	9
50DZ 82	74 - 91	150	15	490	9
50DZ 100	90 -110	120	30	400	9
50DZ 120	105 -135	100	60	336	9.5
50DZ 150	130 -165	85	85	270	9.5
50DZ 180	160 -205	68	100	200	9.5



CASE DO-13

$ 1500 W BIDIRECTIONAL SUPPRESSOR DIODES

Case DO-13

TYPE	V_r (V)	BV_{min} (V)	BV_{max} (V)	I_t (mA)	I_r (uA)	V_C (V)	I_{PP} (A)
1N 6036	5.5	6.75	8.25	10	1000	11.7	128.0
1N 6036A	6.0	7.13	7.88	10	1000	11.3	132.0
1N 6037	6.5	7.38	9.02	10	500	12.5	120.0
1N 6037A	7.0	7.79	8.61	10	500	12.1	124.0
1N 6038	7.0	8.19	10.00	10	200	13.8	109.0
1N 6038A	7.5	8.65	9.55	10	200	13.4	112.0
1N 6039	8.0	9.00	11.00	1	50	15.0	100.0
1N 6039A	8.5	9.50	10.50	1	50	14.5	103.0
1N 6040	8.5	9.90	12.10	1	10	16.2	93.0
1N 6040A	9.0	10.50	11.60	1	10	15.6	96.0
1N 6041	9.0	10.80	13.20	1	5	17.3	87.0
1N 6041A	10.0	11.40	12.60	1	5	16.7	90.0
1N 6042	10.0	11.70	14.30	1	5	19.0	79.0
1N 6042A	11.0	12.40	13.70	1	5	18.2	82.0
1N 6043	11.0	13.50	16.50	1	5	22.0	68.0
1N 6043A	12.0	14.30	15.80	1	5	21.2	71.0
1N 6044	12.0	14.40	17.60	1	5	23.5	64.0
1N 6044A	13.0	15.20	16.80	1	5	22.5	67.0
1N 6045	14.0	16.20	19.80	1	5	26.5	56.5
1N 6045A	15.0	17.10	18.90	1	5	25.2	59.5
1N 6046	16.0	18.00	22.00	1	5	29.1	51.5
1N 6046A	17.0	19.00	21.00	1	5	27.7	54.0
1N 6047	17.0	19.80	24.20	1	5	31.9	47.0
1N 6047A	18.0	20.90	23.10	1	5	30.6	49.0
1N 6048	19.0	21.60	26.40	1	5	34.7	43.0
1N 6048A	20.0	22.80	25.20	1	5	33.2	45.0
1N 6049	21.0	24.30	29.70	1	5	39.1	38.5
1N 6049A	22.0	25.70	28.40	1	5	37.5	40.0
1N 6050	24.0	27.00	33.00	1	5	43.0	34.5
1N 6050A	25.0	28.50	31.50	1	5	41.4	36.0
1N 6051	26.0	29.70	36.30	1	5	47.7	31.5
1N 6051A	28.0	31.40	34.70	1	5	45.7	33.0
1N 6052	29.0	32.40	39.60	1	5	52.0	29.0
1N 6052A	30.0	34.20	37.80	1	5	49.9	30.0
1N 6053	31.0	35.10	42.90	1	5	56.4	26.5
1N 6053A	33.0	37.10	41.80	1	5	53.9	28.0

(Continued)

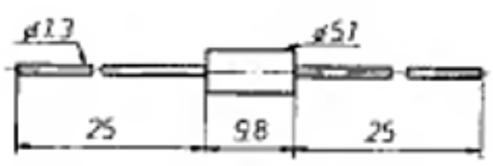
TYPE	V_r (V)	BV_{min} (V)	BV_{max} (V)	I_t (mA)	I_r (uA)	V_C (V)	I_{PP} (A)
1N 6054	34.0	38.70	47.30	1	5	61.9	24.0
1N 6054A	36.0	40.90	45.20	1	5	59.3	25.3
1N 6055	38.0	42.30	51.70	1	5	67.8	22.2
1N 6055A	40.0	44.70	49.40	1	5	64.8	23.2
1N 6056	41.0	45.90	56.10	1	5	73.5	20.4
1N 6056A	43.0	48.50	53.60	1	5	70.1	21.4
1N 6057	45.0	50.40	61.60	1	5	80.5	18.6
1N 6057A	47.0	53.20	58.80	1	5	77.0	19.5
1N 6058	48.0	55.80	68.20	1	5	89.0	16.9
1N 6058A	53.0	58.90	65.10	1	5	85.0	17.7
1N 6059	55.0	61.20	74.80	1	5	98.0	15.3
1N 6059A	58.0	65.60	71.40	1	5	92.0	16.3
1N 6060	60.0	67.50	82.50	1	5	108.0	13.9
1N 6060A	64.0	71.30	78.80	1	5	103.0	14.6
1N 6061	66.0	73.80	90.20	1	5	118.0	12.7
1N 6061A	70.0	77.90	86.10	1	5	113.0	13.3
1N 6062	73.0	81.90	100.00	1	5	131.0	11.4
1N 6062A	75.0	86.50	95.50	1	5	125.0	12.0
1N 6063	81.0	90.00	110.00	1	5	144.0	10.4
1N 6063A	82.0	95.00	105.00	1	5	137.0	11.0
1N 6064	90.0	99.00	121.00	1	5	158.0	9.5
1N 6064A	94.0	105.00	116.00	1	5	152.0	9.9
1N 6065	95.0	108.00	132.00	1	5	176.0	8.5
1N 6065A	100.0	114.00	126.00	1	5	168.0	8.9
1N 6066	105.0	117.00	143.00	1	5	191.0	7.9
1N 6066A	110.0	124.00	137.00	1	5	182.0	8.2
1N 6067	121.0	135.00	165.00	1	5	223.0	6.7
1N 6067A	128.0	143.00	158.00	1	5	213.0	7.0
1N 6068	137.0	153.00	187.00	1	5	258.0	5.8
1N 6068A	145.0	162.00	179.00	1	5	245.0	6.1
1N 6069	145.0	162.00	198.00	1	5	274.0	5.5
1N 6069A	150.0	171.00	189.00	1	5	261.0	5.7
1N 6070	155.0	171.00	210.00	1	5	292.0	5.1
1N 6070A	160.0	181.00	200.00	1	5	278.0	5.4
1N 6071	165.0	180.00	220.00	1	5	308.0	4.9
1N 6071A	170.0	190.00	210.00	1	5	294.0	5.1
1N 6072	175.0	198.00	242.00	1	5	344.0	4.3
1N 6072A	185.0	209.00	231.00	1	5	328.0	4.6

$ Preliminary data

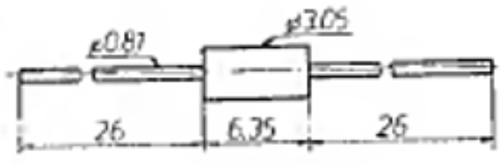
SILICON DIODES

STANDARD RECTIFIERS

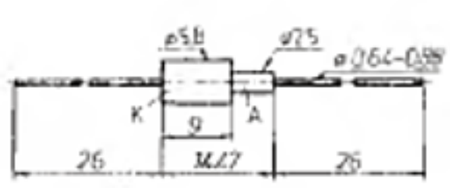
BANEASA S.A.



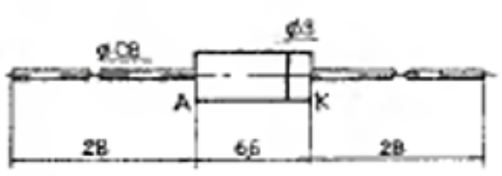
(White band near cathode)
CASES: DO-27A



(White band near cathode)
F-126



DO-13



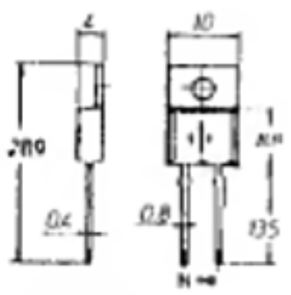
DO-27M

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F @ 25°C & I_F max. (V)	(I_F (A))	I_R @ V_{RRM} & 25°C max. (uA)	100°C max. (uA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
1.1 A_{rms} T_{JM}=150°C R_{thJ-L}≤70°C/W i^2t=5A^2s										
F 057	0.75 #	50	10 !	1	0.75	5	50	0.87	100	DO-13
F 087		80								
F 107		100								
F 207		400								
F 307		600								
F 407		800								
	# T_L=25°C		! T_J=T_{JM}							
1.6 A_{rms} T_{JM}=150°C R_{thJ-L}≤65°C/W i^2t=4.5A^2s										
1N 4001	1 #	50	20 !	1.1	1	5	50	0.95	75	F-126
1N 4002		100								
1N 4003		200								
1N 4004		400								
1N 4005		600								
1N 4006		800								
1N 4007		1000								
	# T_L=75°C		! T_J=T_{JM}							
3 A_{rms} T_{JM}=150°C R_{thJ-A}=30°C/W i^2t=24.5A^2s										
$ D3 N 1	2 #	100	70 !	1.1	2	10	1000	0.6	105	DO-27M
$ D3 N 2		200								
$ D3 N 4		400								
$ D3 N 6		600								
$ D3 N 8		800								
$ D3 N 10		1000								
	# T_C=25°C		! T_J=25°C							
3 A_{rms} T_{JM}=150°C R_{thJ-L}≤50°C/W i^2t=24.5A^2s										
F 102	2 #	100	70 !	1.2	2	10	1000*	1.06	54	DO-13
F 202		200								
F 402		400								
F 602		600								
F 802		800								
F 112		1000								
	# T_L=25°C		! T_J=25°C			* T_J=150°C				
5 A_{rms} T_{JM}=135°C R_{thJ-L}≤20°C/W i^2t=50A^2s										
D3N 1	3 #	100	100 !	1.1	3	10	750	0.64	30	DO-27A
D3N 2		200								
D3N 4		400								
D3N 6		600								
D3N 8		800								
D3N 10		1000								
	# T_L=75°C		! T_J=25°C							
9 A_{rms} T_{JM}=150°C R_{thJ-C}≤6.5°C/W i^2t=28A^2s										
6SI 1P	6 #	100	60 !	1.25	6	15	1000*	0.80	40	TO-220d
6SI 2P		200								
6SI 3P		300								
6SI 4P		400								
6SI 5P		500								
	# T_C=85°C		! T_J=25°C			* T_J=125°C				

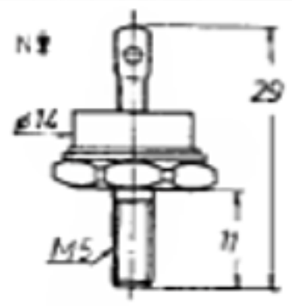
$ Preliminary data

BANEASA S.A.

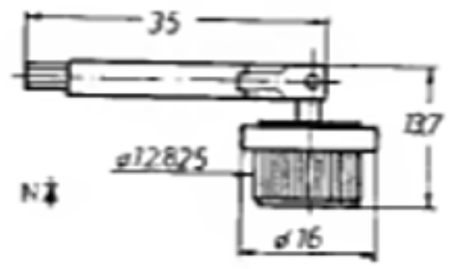
STANDARD RECTIFIERS



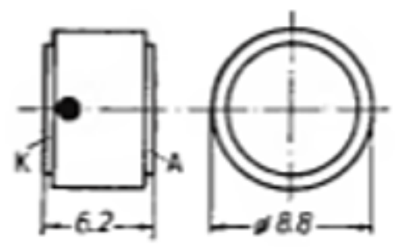
TO-220d



DO-4



DO-21



RAG

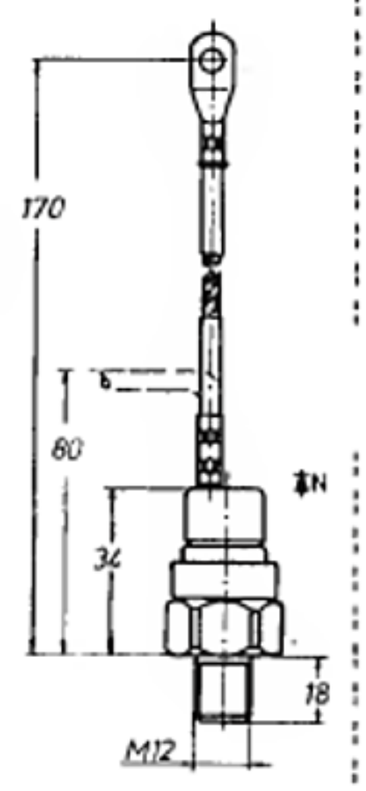
CASES :

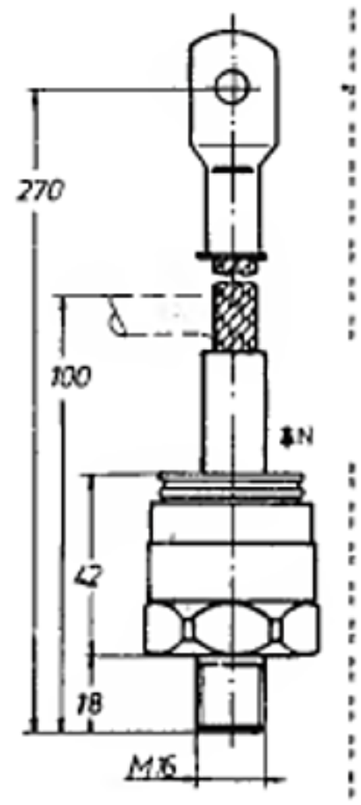
TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F max. (V)	@ 25°C & I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
9 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.2°C/W i^2t=312A^2s										
RAG 306	6 #	300	250 !	1.20	50	0.3	3 *	0.95	3.75	RAG
	# T_C=100°C		! T_J=25°C				* T_J=150°C			
16 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$2.5°C/W i^2t=220A^2s										
D10N 05 (R)	10 #	50	150 !	1.4	35	0.025	3	0.85	15	DO-4
D10N 1 (R)		100								
D10N 2 (R)		200								
D10N 3 (R)		300								
D10N 4 (R)		400								
D10N 5 (R)		500								
D10N 6 (R)		600								
D10N 8 (R)		800								
D10N 10 (R)		1000								
D10N 12 (R)		1200								
D10N 14 (R)		1400								
D10N 16 (R)		1600								
(R) Reverse Pol.	# T_C=125°C		! T_J=T_{JM}							
26 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$2.5°C/W i^2t=312.5A^2s										
D16N 05 (R)	16 #	50	250 !	1.4	50		3	0.90	8.75	DO-4
D16N 1 (R)		100								
D16N 2 (R)		200								
D16N 3 (R)		300								
D16N 4 (R)		400								
D16N 5 (R)		500								
D16N 6 (R)		600								
D16N 8 (R)		800								
D16N 10 (R)		1000								
D16N 12 (R)		1200								
D16N 14 (R)		1400								
D16N 16 (R)		1600								
(R) Reverse Pol.	# T_C=95°C		! T_J=25°C							
30 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.2°C/W i^2t=312A^2s										
RAG 115	15 #	100	250 !	1.20	50		3	0.95	3.75	RAG
RAG 215		200								
RAG 415		400								
RAG 615		600								
	# T_C=100°C		! T_J=25°C							
31 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$2.0°C/W i^2t=312A^2s										
RA 120 (R)	20 #	100	250 !	1.40	60	0.02	3	1.25	2.50	DO-21
RA 220 (R)		200								
(R) Reverse Pol.	# T_C=90°C		! T_J=25°C							
40 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.2°C/W i^2t=800A^2s										
RA 125 (R)	25 #	100	400 !	1.40	80	0.10	3	1.00	4.58	DO-21
RA 225 (R)		200								
(R) Reverse Pol.	# T_C=100°C		! T_J=25°C							

BANEASA S.A.

STANDARD RECTIFIERS

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F @ 25°C & I_F max. (V)	(I_F (A))	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
120 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.48°C/W			i^2t=12.8kA^2s		T_{tight}=20Nm		
D80N 2 (R)	80	200	1600	1.43	350		20			B-27d
D80N 4 (R)		400								
D80N 6 (R)		600								
D80N 8 (R)		800								
D80N 10 (R)		1000								
D80N 12 (R)		1200								
D80N 14 (R)		1400								
D80N 16 (R)		1600								
D80N 18 (R)		1800								
(R) Reverse Pol.										
160 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.42°C/W			i^2t=20kA^2s				
D100N 2 (R)	100	200	2000	1.33	350		20			
D100N 4 (R)		400								
D100N 6 (R)		600								
D100N 8 (R)		800								
D100N 10 (R)		1000								
D100N 12 (R)		1200								
D100N 14 (R)		1400								
D100N 16 (R)		1600								
D100N 18 (R)		1800								
(R) Reverse Pol.										
180 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.36°C/W			i^2t=26.45kA^2s		T_{tight}=20Nm		
D120N 2 (R)	120	200	2.3	1.22	350		20			B-27d
D120N 4 (R)		400								
D120N 6 (R)		600								(See above)
D120N 8 (R)		800								
D120N 10 (R)		1000								
D120N 12 (R)		1200								
D120N 14 (R)		1400								
D120N 16 (R)		1600								
D120N 18 (R)		1800								
(R) Reverse Pol.	# T_C=100°C									
550 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.11°C/W			i^2t=151kA^2s		T_{tight}=45Nm		
D325N 200	325	200	5.5	1.60	1100		20	0.78	0.82	B-42
D325N 400		400								
D325N 600		600								
D325N 800		800								
D325N 1000		1000								
D325N 1200		1200								
D325N 1400		1400								
D325N 1600		1600								
D325N 1800		1800								
D325N 2000		2000								
** D325R 200 ... 2000 are similar to D325N 200 ... 2000 , but with reverse polarity.										
550 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.11°C/W			i^2t=186kA^2s				
D355N 200	355	200	6.1	1.50	1100		20	0.72	0.72	
D355N 400		400								
D355N 600		600								
D355N 800		800								
D355N 1000		1000								
D355N 1200		1200								
D355N 1400		1400								
D355N 1600		1600								
D355N 1800		1800								
D355N 2000		2000								
** D355R 200 ... 2000 are similar to D355N 200 ... 2000 , but with reverse polarity.										

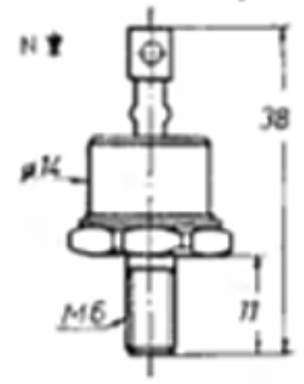




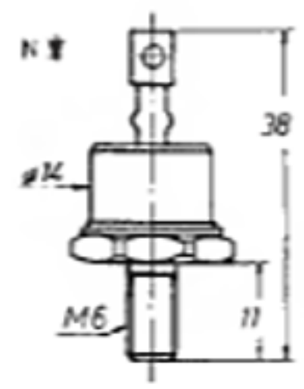
STANDARD RECTIFIERS

BANEASA S.A.

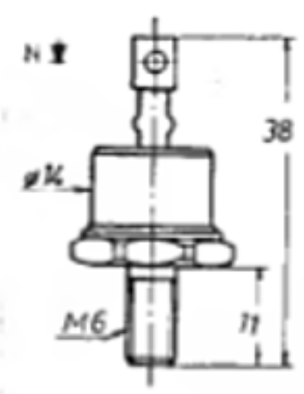
TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F max. (V)	@ 25°C & I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
40 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.1°C/W i^2t=800A^2s										
D25N 05 (R)	25 #	50	300	1.4	80	0.10	5	0.90	5.6	DO-5
D25N 1 (R)		100								
D25N 2 (R)		200								
D25N 3 (R)		300								
D25N 4 (R)		400								
D25N 5 (R)		500								
D25N 6 (R)		600								
D25N 8 (R)		800								
D25N 10 (R)		1000								
D25N 12 (R)		1200								
D25N 14 (R)		1400								
D25N 16 (R)		1600								
(R) Reverse Pol.	# T_C=125°C		T_J=T_{JM}							



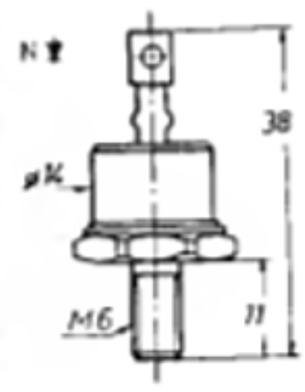
48 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.0°C/W i^2t=580A^2s										
D32N 05 (R)	32	50	340	1.7	100	0.1	5	0.90	7.85	DO-5
D32N 1 (R)		100								
D32N 2 (R)		200								
D32N 3 (R)		300								
D32N 4 (R)		400								
D32N 5 (R)		500								
D32N 6 (R)		600								
D32N 8 (R)		800								
D32N 10 (R)		1000								
D32N 12 (R)		1200								
D32N 14 (R)		1400								
D32N 16 (R)		1600								
(R) Reverse Pol.										



63 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$1.0°C/W i^2t=720A^2s										
D40N 05 (R)	40	50	380	1.35	125	0.2	10	1.15	6.5	DO-5
D40N 1 (R)		100								
D40N 2 (R)		200								
D40N 3 (R)		300								
D40N 4 (R)		400								
D40N 5 (R)		500								
D40N 6 (R)		600								
D40N 8 (R)		800								
D40N 10 (R)		1000								
D40N 12 (R)		1200								
D40N 14 (R)		1400								
D40N 16 (R)		1600								
(R) Reverse Pol.										



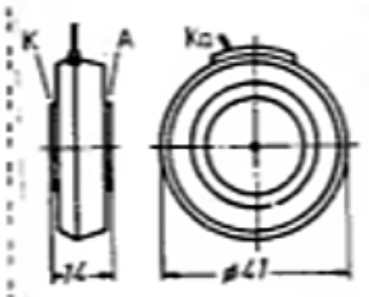
80 A_{rms} T_{JM}=150°C $R_{thJ-C}\leq$0.9°C/W i^2t=880A^2s										
D50N 05 (R)	50 #	50	420	1.55	150	0.20	10	1.10	4.0	DO-5
D50N 1 (R)		100								
D50N 2 (R)		200								
D50N 3 (R)		300								
D50N 4 (R)		400								
D50N 5 (R)		500								
D50N 6 (R)		600								
D50N 8 (R)		800								
D50N 10 (R)		1000								
D50N 12 (R)		1200								
D50N 14 (R)		1400								
D50N 16 (R)		1600								
(R) Reverse Pol.	# T_C=80°C									



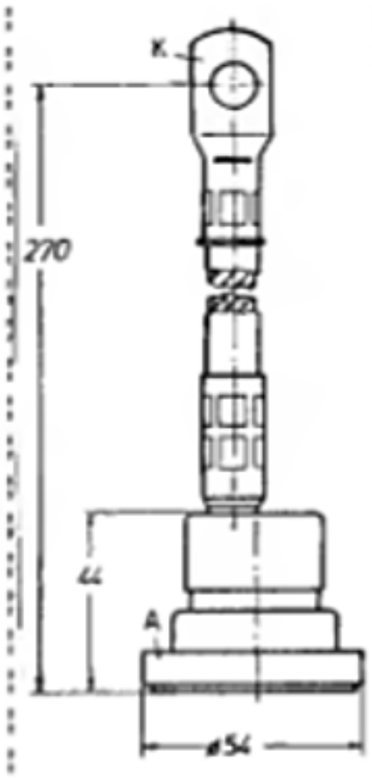
STANDARD RECTIFIERS

BANEASA S.A.

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F @ 25°C & I_F max. (V)	I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
650 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.1°C/W			i^2t=80kA^2s		F_{clamp}=3 - 4.5kN		
D358N 200	360	200	4.0	1.65	1000		20	0.72	0.90	T-20d
D358N 400		400								
D358N 600		600								
D358N 700		700								
D358N 800		800								
D358N 1000		1000								
D358N 1200		1200								
D358N 1400		1400								
D358N 1600		1600								
D358N 1800		1800								

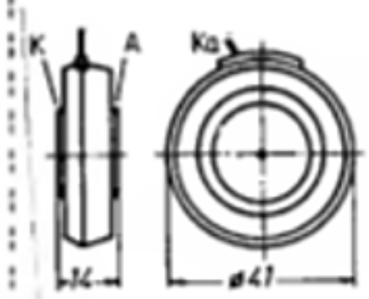


700 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.09°C/W			i^2t=266kA^2s		F_{clamp}=5.5 - 8kN		
D400N 200	400	200	7.3	1.50	1.0		40	0.8	0.6	E-50d
D400N 400		400								
D400N 600		600								
D400N 800		800								
D400N 1000		1000								
D400N 1200		1200								
D400N 1400		1400								
D400N 1600		1600								
D400N 1800		1800								
D400N 2000		2000								
** D400R 200 ... 2000 are similar to D400N 200 ... 2000 , but with reverse polarity.										



700 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.1°C/W			i^2t=100kA^2s		F_{clamp}=3 - 4.5kN		
D408N 200	410 #	200	4.5	1.45	1.0		20	0.72	0.6	T-20d
D408N 400		400								
D408N 600		600								
D408N 700		700								
D408N 800		800								
D408N 1000		1000								
D408N 1200		1200								
D408N 1400		1400								
D408N 1600		1600								
D408N 1800		1800								

T_C=150°C



700 A_{rms}	T_{JM}=150°C		$R_{thJ-C}\leq$0.09°C/W			i^2t=361kA^2s		F_{clamp}=5.5 - 8kN		
D450N 200	450	200	8.5	1.30	1.0		40	0.8	0.4	E-50d
D450N 400		400								
D450N 600		600								(See above)
D450N 800		800								
D450N 1000		1000								
D450N 1200		1200								
D450N 1400		1400								
D450N 1600		1600								
D450N 1800		1800								
D450N 2000		2000								
** D450R 200 ... 2000 are similar to D450N 200 ... 2000 , but with reverse polarity.										

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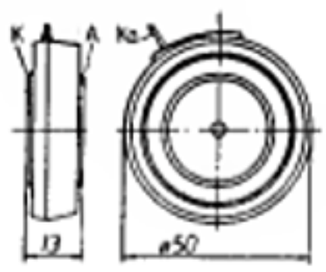
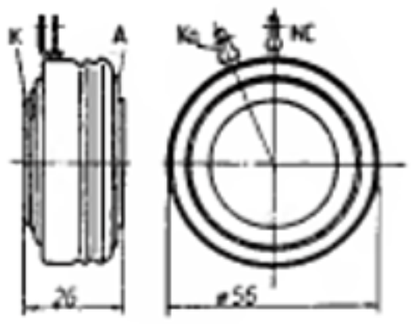
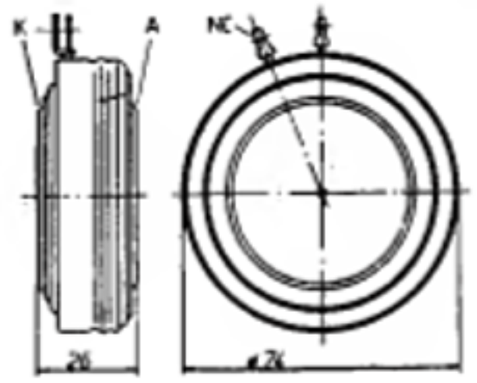
STANDARD RECTIFIERS







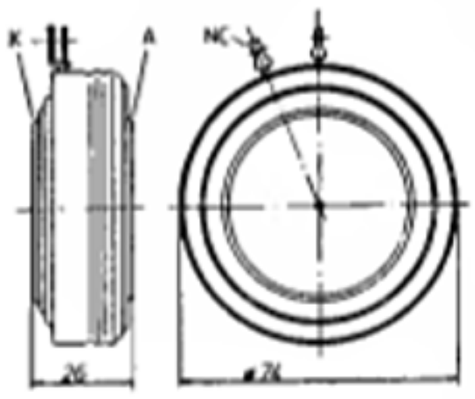
CASES : T-28d T-30 T-50

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F @ 25°C & I_F max. (V)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
1780 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.045°C/W i^2t=806kA^2s F_{clamp}=5.5 - 8kN									
D798N 200	800	200	12.7	1.85 @ 3.4		30	0.75	0.33	T-28d
D798N 400		400							
D798N 600		600							
D798N 800		800							
D798N 1000		1000							
D798N 1200		1200							
D798N 1400		1400							
D798N 1600		1600							
D798N 1800		1800							
1500 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.038°C/W i^2t=500kA^2s F_{clamp}=15 - 18kN									
D800N 1400	800	1400	10	2.1 @ 3.0		50	0.85	0.4	T-30
D800N 1600		1600							
D800N 1800		1800							
D800N 2000		2000							
D800N 2200		2200							
D800N 2400		2400							
D800N 2600		2600							
D800N 2800		2800		! T_J=125°C					
2000 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.036°C/W i^2t=700kA^2s F_{clamp}=15 - 18kN									
D1000N 1600	1000 #	1600	11.8	1.7 @ 3.0		50	0.8	0.35	T-30
D1000N 1800		1800							
D1000N 2000		2000							
D1000N 2200		2200							
D1000N 2400		2400							
D1000N 2600		2600							
D1000N 2800		2800							
# T_C=90°C ! T_J=125°C									
2000 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.018°C/W i^2t=1445kA^2s F_{clamp}=20 - 25kN									
D1300N 200	1300	200	17	1.9 @ 3.0		50	0.95	0.32	T-50
D1300N 400		400							
D1300N 600		600							
D1300N 800		800							
D1300N 1000		1000							
D1300N 1200		1200							
D1300N 1400		1400							
D1300N 1600		1600							
D1300N 1800		1800							
D1300N 2000		2000							

SILICON DIODES

STANDARD RECTIFIERS

BANEASA S.A.

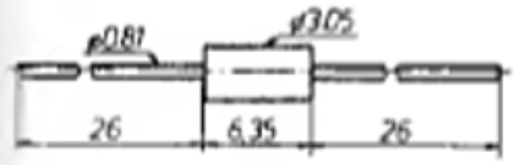


CASE : T-50

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms (A)	V_F max. (V)	@ 25°C & I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
3600 A_{rms}	T_{JM}=150°C		R_{thJ-C}≤0.018°C/W		i^2t=2420kA^2s		F_{clamp}=20 - 25kN			
D1600N 200	1600	200	22	1.5	3.0	50		0.78	0.21	T-50
D1600N 400		400								
D1600N 600		600								
D1600N 800		800								
D1600N 1000		1000								
D1600N 1200		1200								
D1600N 1400		1400								
D1600N 1600		1600								
D1600N 1800		1800								
D1600N 2000		2000								
2700 A_{rms}	T_{JM}=150°C		R_{thJ-C}≤0.017°C/W		i^2t=3254kA^2s		F_{clamp}=25 - 30kN			
D1800N 2000	1800	2000	25.5k	1.62	3.0	100		0.9	0.3	T-50
D1800N 2200		2200								
D1800N 2400		2400								
D1800N 2600		2600								
D1800N 2800		2800								
D1800N 3000		3000								
D1800N 3200		3200								
D1800N 3400		3400								
D1800N 3600		3600								

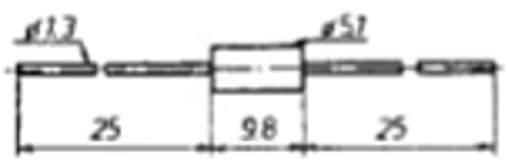
T_J=150°C

BANEASA S.A.



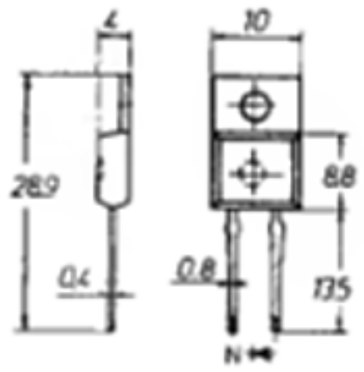
(White band near cathode)

CASES: F-126

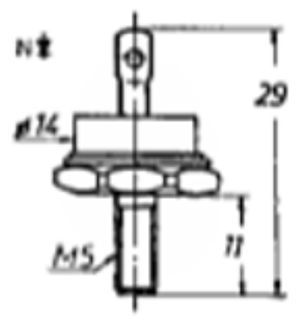


(White band near cathode)

DO-27A



TO-220d



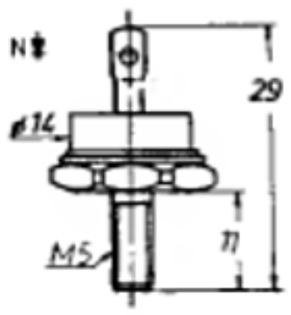
DO-4

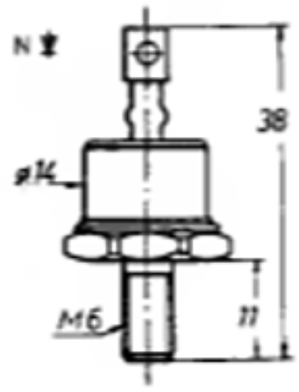
TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms & T_{JM} (A)	V_F @ 25°C & I_F max. (V)	(I_F) (A)	I_R @ V_{RRM} & 25°C max. (uA)	100°C max. (uA)	V_{FO} max. (V)	r_F ($x10^{-3}$ ohms)	CASE STYLE
0.65 A_{rms} T_{JM}=150°C R_{thJ-L}≤75°C/W i^2t=0.72A^2s t_{rr}≤0.3us										
BA 157	0.4 #	400	12	1.50	0.40	5	100	1.2	450	F-126
BA 158		600								
BA 159		1000								
BAX 157 *	0.4 #	400	12	0.97	0.40	5	100	0.87	143	
* t_{rr}≤0.4us	# T_L=25°C									
0.65 A_{rms} T_{JM}=150°C R_{thJ-L}≤75°C/W i^2t=0.72A^2s t_{rr}≤1.0us										
DRR 104	0.4 #	100	12	1.50	0.40	5	100	1.2	450	F-126
DRR 204		200								
DRR 404		400								
DRR 604		600								
DRR 114		1000								
	# T_L=25°C									
3 A_{rms} T_{JM}=135°C R_{thJ-L}≤45°C/W i^2t=8A^2s t_{rr}≤1.2us										
D2F-1	2 #	100	40	1.50	5		500			DO-27A
D2F-4		400								
D2F-6		600								
D2F-8		800								
D2F-10		1000								
D2F-12		1200								
BY 228		1500								
	# T_L=45°C									
9 A_{rms} T_{JM}=125°C R_{thJ-C}≤6.5°C/W i^2t=18A^2s t_{rr}≤0.6us										
6DRR 1P (R)	6 #	100	60	1.25	5	15	1000 *	0.9	45	TO-220d
6DRR 2P (R)		200								
6DRR 3P (R)		300								
6DRR 4P (R)		400								
6DRR 5P (R)		500								
(R) Reverse pol.	# T_C=85°C		T_J=25°C			* T_J=125°C				
16 A_{rms} T_{JM}=150°C R_{thJ-C}≤2.4°C/W i^2t=110A^2s t_{rr}≤0.6us										
D10F 05 (R)	10 #	50	150	1.30	10	50	3000 *	1	19	DO-4
D10F 1 (R)		100								
D10F 2 (R)		200								
D10F 3 (R)		300								
D10F 4 (R)		400								
D10F 5 (R)		500								
D10F 6 (R)		600								
D10F 8 (R)		800								
D10F 10 (R)		1000								
(R) Reverse Pol.	# T_C=115°C					* T_J=115°C				

SILICON DIODES

FAST RECOVERY

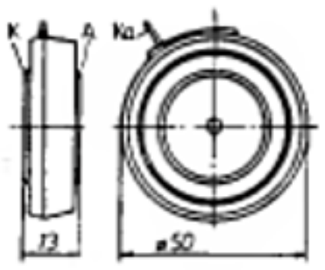
BANEASA S.A.

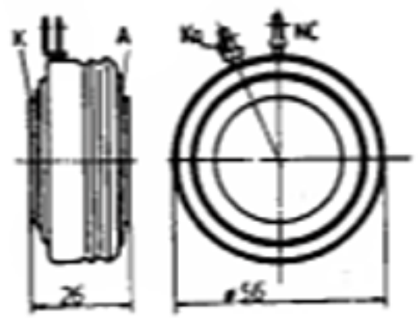




CASES : DO-4 DO-5

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms & T_{JM} (A)	V_F max. (V)	@ 25°C & I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
26 A_{rms} T_{JM}=150°C R_{thJ-C}≤1.9°C/W i^2t=160A^2s t_{rr}≤0.6us										
D16F 05 (R)	16 #	50	180	1.40	16	0.05	3	1.1	13.75	DO-4
D16F 1 (R)		100								
D16F 2 (R)		200								
D16F 3 (R)		300								
D16F 4 (R)		400								
D16F 5 (R)		500								
D16F 6 (R)		600								
D16F 8 (R)		800								
D16F 10 (R)		1000								
(R) Reverse Pol. # T_C=100°C										
40 A_{rms} T_{JM}=150°C R_{thJ-C}≤1.1°C/W i^2t=380A^2s t_{rr}≤0.6us										
D25F 05 (R)	25 #	50	275	1.50	25	0.10	5	1.05	11.25	DO-5
D25F 1 (R)		100								
D25F 2 (R)		200								
D25F 3 (R)		300								
D25F 4 (R)		400								
D25F 5 (R)		500								
D25F 6 (R)		600								
D25F 8 (R)		800								
D25F 10 (R)		1000								
(R) Reverse pol. # T_C=100°C										
50 A_{rms} T_{JM}=150°C R_{thJ-C}≤1.0°C/W i^2t=450A^2s t_{rr}≤0.8us										
D32F 05 (R)	32 #	50	300	1.50	30	0.10	5	1.1	13.75	DO-5
D32F 1 (R)		100								
D32F 2 (R)		200								
D32F 3 (R)		300								
D32F 4 (R)		400								
D32F 5 (R)		500								
D32F 6 (R)		600								
D32F 8 (R)		800								
D32F 10 (R)		1000								
(R) Reverse pol. # T_C=90°C										
62 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.9°C/W i^2t=720A^2s t_{rr}≤0.8us										
D40F 05 (R)	40 #	50	380	1.50	40	0.10	5	1.1	5.8	DO-5
D40F 1 (R)		100								
D40F 2 (R)		200								
D40F 3 (R)		300								
D40F 4 (R)		400								
D40F 5 (R)		500								
D40F 6 (R)		600								
D40F 8 (R)		800								
D40F 10 (R)		1000								
(R) Reverse pol. # T_C=90°C										





CASES : T-28d T-30

TYPE	I_{FAVM} (A)	V_{RRM} (V)	I_{FSM} t_p=10ms & T_{JM} (A)	V_F max. (V)	@ 25°C & I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	100°C max. (mA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	CASE STYLE
280 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.14°C/W i^2t=20kA^2s Q_s≤40uC F_{clamp}=3 - 4.5kN										
$ D178S 200	180	200	2000	1.90	500		40	1.1	2	T-28d
$ D178S 400		400								
$ D178S 600		600								
$ D178S 800		800								
$ D178S 1000		1000								
$ D178S 1200		1200								
$ D178S 1400		1400								

$ Preliminary data

400 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.11°C/W i^2t=51.2kA^2s Q_s≤62uC F_{clamp}=3- 4.5kN										
$ D208S 200	210	200	3200	1.60	500		40	1.1	2	T-28d
$ D208S 400		400								
$ D208S 600		600								
$ D208S 800		800								
$ D208S 900		900								
$ D208S 1000		1000								
$ D208S 1200		1200								
$ D208S 1400		1400								

$ Preliminary data

800 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.06°C/W i^2t=200kA^2s Q_s≤360uC F_{clamp}=8- 12kN										
D400S 1200	400	1200	6320	2.40	1200		80	1.2	0.89	T-30
D400S 1400		1400								
D400S 1600		1600								
D400S 1800		1800								
D400S 2000		2000								
D400S 2200		2200								
D400S 2400		2400								
D400S 2600		2600								

1160 A_{rms} T_{JM}=150°C R_{thJ-C}≤0.06°C/W i^2t=344kA^2s Q_s≤360uC F_{clamp}=8- 12kN										
D495S 1200	495 #	1200	8300	2.10	1200		80	1.07	0.50	T-30
D495S 1400		1400								
D495S 1600		1600								
D495S 1800		1800								
D495S 2000		2000								
D495S 2200		2200								
D495S 2400		2400								
D495S 2600		2600								

T_C=90°C

SILICON DIODES

CONTROLLED AVALANCHE

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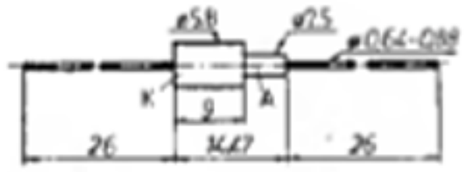
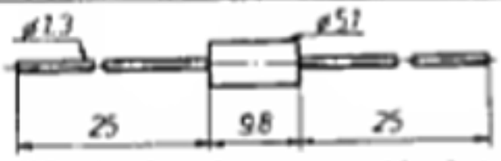
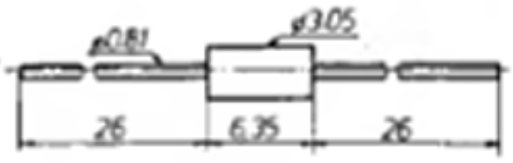


CASE : DO-13



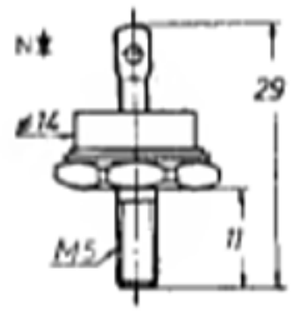
(White band near cathode)

CASES: DO-27A

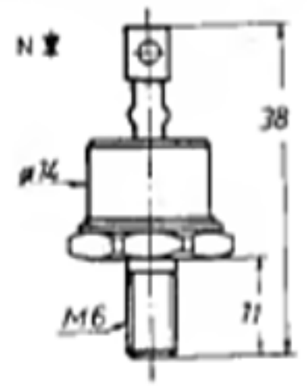


(White band near cathode)

F-126



DO-4



DO-5

TYPE	I_{FAVM} (A)	V_{RRM} (V)	V_F @ 25°C & I_F max. (V)	I_F (A)	I_R @ I_{JM} max. (mA)	V_{FO} max. (V)	r_F ($\times 10^{-3}$ ohms)	V_{RA} min.-max. (V)	P_{RSM} (kW)	CASE STYLE
1.6 A_{rms} T_{JM}=150°C I_{FSM}=30A $R_{thJ-L}\leq 65°C/W$ $i^2t=4.5A^2s$										
D1A 4	1 #	400	1.10	1	0.05	1.0	66	450- 750	5	F-126
D1A 6		600						720-1000	3	
D1A 8		800						950-1400	2	
D1A 10		1000						1200-1700	1	
D1A 12		1200						1400-2000	0.5	
	# T_L=75°C									
1.6 A_{rms} T_{JM}=175°C I_{FSM}=30A $R_{thJ-L}\leq 80°C/W$ $i^2t=4.5A^2s$										
F 4AC	1 #	400	1.10	1	0.50	1.0	66	450- 750	5	DO-13
F 6AC		600						720-1000	3	
F 8AC		800						950-1400	2	
F 10AC		1000						1200-1700	1	
	# T_L=50°C									
5 A_{rms} T_{JM}=135°C I_{FSM}=100A $R_{thJ-L}\leq 20°C/W$ $i^2t=50A^2s$										
D3AC 4	3 #	400	1.10	3	0.75*			450- 750	10	DO-27A
D3AC 6		600						720-1000	6	
D3AC 8		800						950-1400	4	
D3AC 10		1000						1200-1700	2	
	# T_L=75°C				* T_J=100°C					
16 A_{rms} T_{JM}=160°C I_{FSM}=150A $R_{thJ-C}\leq 2.5°C/W$ $i^2t=110A^2s$										
D10A 4 (R)	10 #	400	1.40	35	3	0.85	15	450- 750	30	DO-4
D10A 6 (R)		600						720-1000	18	
D10A 8 (R)		800						950-1400	12	
D10A 10 (R)		1000						1200-1700	6	
(R) Reverse pol.	# T_C=125°C									
25 A_{rms} T_{JM}=175°C I_{FSM}=180A $R_{thJ-C}\leq 2.5°C/W$ $i^2t=160A^2s$										
D16A 4 (R)	16 #	400	1.40	50	3	0.82	9.8	450- 750	40	DO-4
D16A 6 (R)		600						720-1000	25	
D16A 8 (R)		800						950-1400	16	
D16A 10 (R)		1000						1200-1700	10	
D16A 12 (R)		1200						1400-2000	6	
D16A 14 (R)		1400						1600-2400	4	
(R) Reverse pol.	# T_C=125°C									
40 A_{rms} T_{JM}=160°C I_{FSM}=300A $R_{thJ-C}\leq 1.1°C/W$ $i^2t=450A^2s$										
D25A 4 (R)	25 #	400	1.40	80	5	0.90	5.6	450- 750	60	DO-5
D25A 6 (R)		600						720-1000	35	
D25A 8 (R)		800						950-1400	25	
D25A 10 (R)		1000						1200-1700	13	
D25A 12 (R)		1200						1400-2000	10	
D25A 14 (R)		1400						1600-2400	7	
(R) Reverse pol.	# T_C=125°C									

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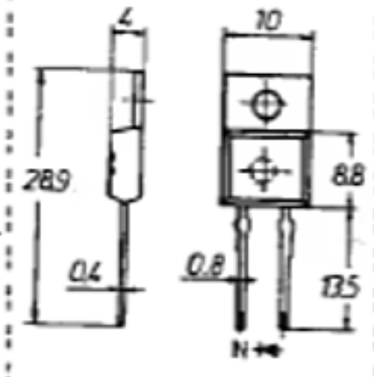
T_{JM}=125°C I_{FSM}=135A $R_{thJ-C} \leq 3°C/W$

TYPE	I_{FAVM} @ T_C (A)	(^oC)	V_{RRM} (V)	V_F @ 25°C & I_F # max. (V)	(I_F (A))	I_R @ V_{RRM} #: T_J=25°C max. (µA)	T_J=125°C max. (µA)	r_F ($x10^{-3}$ ohms)	C_{tot} * T_{VJ}=25°C max. (nF)	CASE STYLE
6BS 20	6	125	20	0.75	6	10	40		1.5	TO-220d
6BS 25			25							
6BS 30			30							
6BS 35			35							
6BS 40			40							
6BS 45			45							
6BS 50			50							
6BS 55			55							
6BS 60			60							
8BS 20	8	125	20	0.75	8	10	40		1.5	
8BS 25			25							
8BS 30			30							
8BS 35			35							
8BS 40			40							
8BS 45			45							
8BS 50			50							
8BS 55			55							
8BS 60			60							
10BS 20	10	125	20	0.75	10	10	40		1.5	
10BS 25			25							
10BS 30			30							
10BS 35			35							
10BS 40			40							
10BS 45			45							
10BS 50			50							
10BS 55			55							
10BS 60			60							
12BS 20	12	125	20	0.75	12	10	40		1.5	
12BS 25			25							
12BS 30			30							
12BS 35			35							
12BS 40			40							
12BS 45			45							
12BS 50			50							
12BS 55			55							
12BS 60			60							
14BS 20	14	125	20	0.75	14	10	40		1.5	
14BS 25			25							
14BS 30			30							
14BS 35			35							
14BS 40			40							
14BS 45			45							
14BS 50			50							
14BS 55			55							
14BS 60			60							
16BS 20	16	125	20	0.75	16	10	40		1.5	
16BS 25			25							
16BS 30			30							
16BS 35			35							
16BS 40			40							
16BS 45			45							
16BS 50			50							
16BS 55			55							
16BS 60			60							
18BS 20	18	125	20	0.75	18	10	40		1.5	
18BS 25			25							
18BS 30			30							
18BS 35			35							
18BS 40			40							
18BS 45			45							
18BS 50			50							
18BS 55			55							
18BS 60			60							



Test conditions : # 300 us pulse width, 2% duty factor
* V_F = 5V, f = 1MHz

SILICON DIODES

POWER SCHOTTKY

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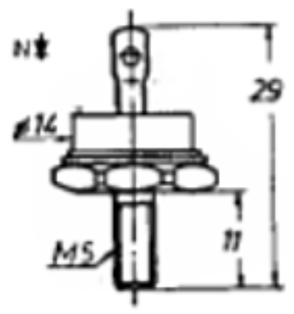
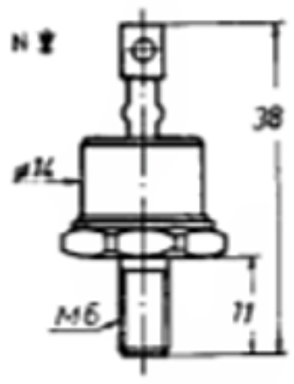
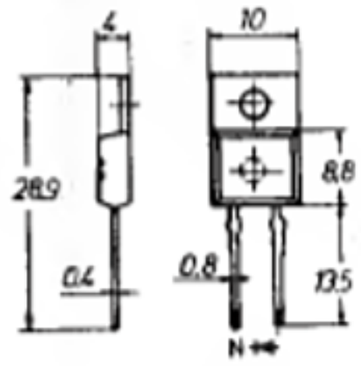






CASES : DO-4 DO-5 TO-220d

T_{JM}=125°C I_{FSM}=135A R_{thJ-C}≤3°C/W

TYPE	I_{FAVM} @ T_C (A) (°C)	V_{RRM} (V)	V_F @ 25°C & I_F # max. (V) (A)	I_R @ V_{RRM} #: T_J=25°C max. (uA)	T_J=125°C max. (uA)	r_F (x10^{-3} ohms)	C_{tot} * T_{VJ}=25°C max. (nF)	CASE STYLE
20BS 20	20 125	20	0.75 20	10	40		1.5	TO-220d
20BS 25		25						
20BS 30		30						
20BS 35		35						
20BS 40		40						
20BS 45		45						
20BS 50		50						
20BS 55		55						
20BS 60		60						

Test conditions : # 300 us pulse width, 2% duty factor
* V_F = 5V, f = 1MHz

TYPE	I_{FAVM} @ T_C (A) (°C)	V_{RRM} (V)	V_F @ 25°C & I_F max. (V) (A)	I_R T_J=25°C max. (uA)	V_{FO} max. (V)	r_F (x10^{-3} ohms)	C_{tot} T_{VJ}=25°C max. (nF)	CASE STYLE
32 A_{rms}	T_{JM}=125°C	I_{FSM}=400A	R_{thJ-C}≤1.5°C/W	i^2t=800A^2s				
DS20S 20	20 97	20	0.65 20	20	0.38	6.2	1.5	DO-4
DS20S 30		30						
DS20S 35		35						
DS20S 40		40						
DS20S 45		45						
(R) Reverse pol.								
48 A_{rms}	T_{JM}=125°C	I_{FSM}=500A	R_{thJ-C}≤1.5°C/W	i^2t=1.25kA^2s				
DS30S 20	30 97	20	0.65 30	20	0.38	6.2	1.5	DO-4
DS30S 30		30						
DS30S 35		35						
DS30S 40		40						
DS30S 45		45						
(R) Reverse pol.								
79 A_{rms}	T_{JM}=125°C	I_{FSM}=700A	R_{thJ-C}≤0.9°C/W	i^2t=2.45kA^2s				
DS50S 20	50 89	20	0.65 50	25	0.38	2.75	4	DO-5
DS50S 30		30						
DS50S 35		35						
DS50S 40		40						
DS50S 45		45						
(R) Reverse pol.								
95 A_{rms}	T_{JM}=125°C	I_{FSM}=800A	R_{thJ-C}≤0.9°C/W	i^2t=3.20kA^2s				
DS60S 20	60 89	20	0.65 60	25	0.38	2.75	4	DO-5
DS60S 30		30						
DS60S 35		35						
DS60S 40		40						
DS60S 45		45						
(R) Reverse pol.								

S C R s

Mains Frequency Thyristors _____ page 57

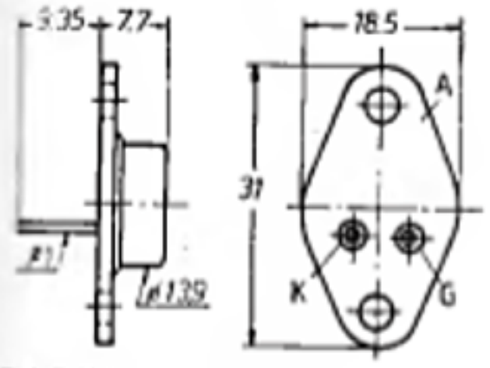
Fast Switching Thyristors _____ page 64

Special Types _____ page 69

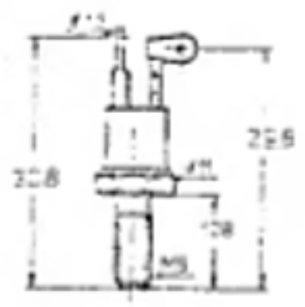
Triacs _____ page 70

BANEASA S.A.

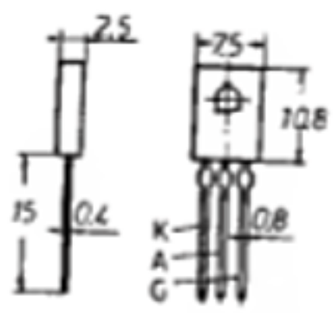
MAINS FREQUENCY THYRISTORS



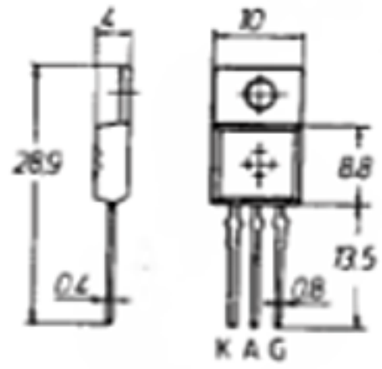
CASES: F-22



TO-64



TO-126 (SOT-32)



TO-220

TYPE	I_{TAVM}	V_{RRM} = V_{DRM}	I_{TSM} @ T_{JM}	I_{RM} = I_{DM} @ T_{JM}	JUNCTION TEMPERATURE = 25°C V_{GT} max.	I_{GT} max.	I_H max.	V_{TM} @ I_{TM}		dv/dt min.	di/dt max.	CASE STYLE
	(A)	(V)	(A)	(mA)	(V)	(mA)	(mA)	(V)	(A)	(V/us)	(A/us)	
1.6 A_{rms} T_{JM}=125°C i^2t=0.5A^2s t_q=300us R_{thJ-C}≤30°C/W												
T1N 05	1 #	50	10	1	2	10	20	2	3	50+		TO-126
T1N 1		100										
T1N 2		200										
T1N 4		400										
T1N 6		600										
T1N 8		800										
	# T_C=100°C											
4.7 A_{rms} T_{JM}=125°C i^2t=4.5A^2s t_q=80us R_{thJ-C}≤4°C/W												
T3N 05	3 #	50	30 *	1.5	3	30	70	2	10	50+	50	F-22
T3N 1		100										
T3N 2		200										
T3N 4		400										
T3N 6		600										
T3N 8		800										
	# T_C=100°C		* T_J=100°C									
4.7 A_{rms} T_{JM}=100°C i^2t= 4.5A^2s t_q=50us R_{thJ-C}≤4°C/W												
T3N 05P	3 #	50	30 *	0.5 *	2	30	50	2.7	10	50		TO-220
T3N 1P		100										
T3N 2P		200										
T3N 3P		300										
T3N 4P		400										
T3N 5P		500										
T3N 6P		600										
	# T_C=70°C		* T_J=100°C									
7.4 A_{rms} T_{JM}=60°C i^2t=18A^2s R_{thJ-C} 3.2°C/W												
# 2N 1770	4.7	25	60	2	2	10		1.85	15			TO-64
# 2N 1771		50										
# 2N 1772		100										
# 2N 1773		150										
# 2N 1774		200										
# 2N 1775		250										
# 2N 1776		300										
# 2N 1777		400										
# 2N 1778		500										
# 2N 1779		600										
9.4 A_{rms} T_{JM}=100°C i^2t=18A^2s t_q=50us R_{thJ-C}≤2.6°C/W												
T8N 05P	6 #	50	60 *	0.5 *	2	30	50	2	18	50		TO-220
T8N 1P		100										
T8N 2P		200										
T8N 3P		300										
T8N 4P		400										
T8N 5P		500										
T8N 6P		600										
	# T_C=70°C		* T_J=100°C									

Preliminary data

Note: (+) Different dv/dt groups : B=50 V/us ; C=100V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

MAINS FREQUENCY THYRISTORS

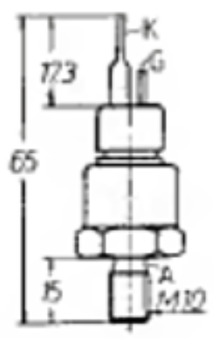
BANEASA S.A.

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V) (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
16 A_{rms} T_{JM}=125°C i^2t=50A^2s t_q=200us R_{thJ-C}≤2°C/W											
T10N 05	10 #	50	100	5	2	50	100	2.2 30	50+	100	TO-48
T10N 1		100									
T10N 2		200									
T10N 3		300									
T10N 4		400									
T10N 5		500									
T10N 6		600									
T10N 7		700									
T10N 8		800									
T10N 9		900									
T10N 10		1000									
T10N 11		1100									
T10N 12		1200									
	# T_C=85°C										
25 A_{rms} T_{JM}=125°C i^2t=200A^2s t_q=200us R_{thJ-C}≤1.5°C/W											
T16N 05	16 #	50	150	5	2	50	100	2.2 50	50+	100	TO-48
T16N 1		100									
T16N 2		200									
T16N 3		300									
T16N 4		400									
T16N 5		500									
T16N 6		600									
T16N 7		700									
T16N 8		800									
T16N 9		900									
T16N 10		1000									
T16N 11		1100									
T16N 12		1200									
	# T_C=75°C										
34 A_{rms} T_{JM}=125°C i^2t=312A^2s t_q=200us R_{thJ-C}≤1.2°C/W											
T22N 05	22	50	250	5	2	100	120	2 70	50+	100	TO-48
T22N 1		100									
T22N 2		200									
T22N 3		300									
T22N 4		400									
T22N 5		500									
T22N 6		600									
T22N 7		700									
T22N 8		800									
T22N 9		900									
T22N 10		1000									
T22N 11		1100									
T22N 12		1200									
37 A_{rms} T_{JM}=125°C i^2t=700A^2s t_q=80us R_{thJ-C}≤0.84°C/W											
T25N 1	25	100	375 #	10	1.5	150		2.1 75	50+	50	DO-5Ty
T25N 2		200									
T25N 3		300									
T25N 4		400									
T25N 5		500									
T25N 6		600									
T25N 7		700									
T25N 8		800									
T25N 9		900									
T25N 10		1000									
T25N 11		1100									
T25N 12		1200									
			# T_J=25°C								

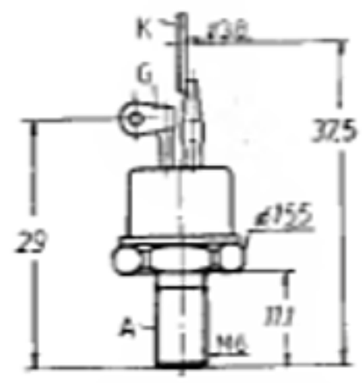
Note: (+) Different dv/dt groups : B=50 V/us ; C=100 V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

BANEASA S.A.

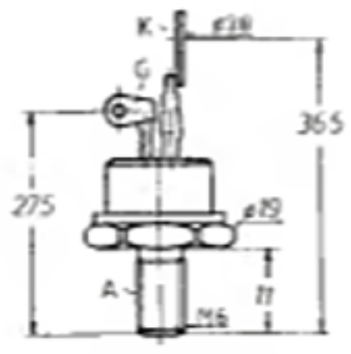
MAINS FREQUENCY THYRISTORS



CASES : B-22



TO-48



DO-5Ty

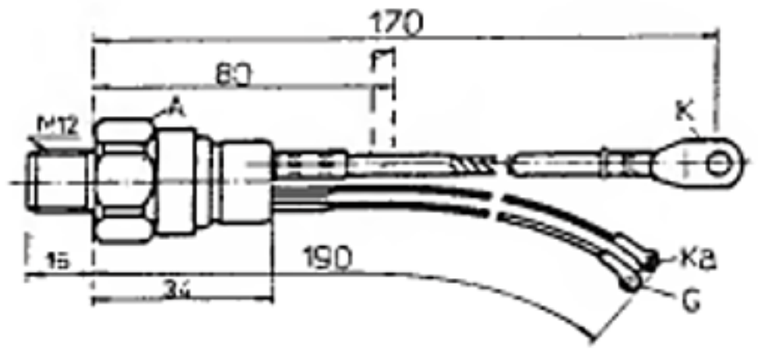
TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	(A)	$\frac{dv}{dt}$ min. (V/us)	$\frac{di}{dt}$ max. (A/us)	CASE STYLE
45 A_{rms} T_C=85°C T_{JM}=125°C i^2t=1000A^2s t_q=80us R_{thJ-C}≤0.84°C/W												
T30N 1	30	100	450 #	10	1.5	150		1.8	90	50+	50	DO-5Ty
T30N 2		200										
T30N 3		300										
T30N 4		400										
T30N 5		500										
T30N 6		600										
T30N 7		700										
T30N 8		800										
T30N 9		900										
T30N 10		1000										
T30N 11		1100										
T30N 12		1200										
			# T_J=25°C									
60 A_{rms} T_{JM}=125°C i^2t=2.8kA^2s t_q=400us R_{thJ-C}≤0.72°C/W T_{tight}=8Nm												
T32N 400	32	400	750	20	2	200	300	2.6	200	400*	120	B-22
T32N 600		600										
T32N 800		800										
T32N 1000		1000										
T32N 1100		1100										
T32N 1200		1200										
T32N 1400		1400										
T32N 1600		1600										
T32N 1800		1800										
80 A_{rms} T_{JM}=125°C i^2t=4.0kA^2s t_q=400us R_{thJ-C}≤0.6°C/W T_{tight}=8Nm												
T40N 400	40	400	900	20	2	200	300	2.4	200	400*	120	B-22
T40N 600		600										
T40N 800		800										
T40N 1000		1000										
T40N 1100		1100										
T40N 1200		1200										
T40N 1400		1400										
T40N 1600		1600										
T40N 1800		1800										
80 A_{rms} T_{JM}=125°C i^2t=5.0kA^2s t_q=400us R_{thJ-C}≤0.44°C/W T_{tight}=8Nm												
T50N 400	50	400	1000	20	2	200	300	2.3	200	400*	120	B-22
T50N 600		600										
T50N 800		800										
T50N 1000		1000										
T50N 1100		1100										
T50N 1200		1200										
T50N 1400		1400										
T50N 1600		1600										
T50N 1800		1800										

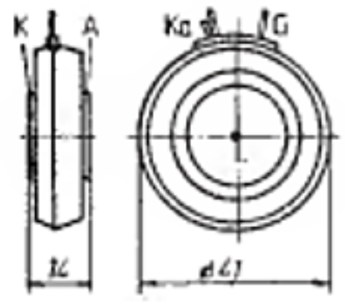
Notes: (+) Different dv/dt Groups : B=50 V/us ; C=100 V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us
(*) Different dv/dt Groups : C=400 V/us ; F=1000 V/us

Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}

MAINS FREQUENCY THYRISTORS

BANEASA S.A.





CASES : B-27 T-20

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} (V)	@ I_{TM} (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
160 A_{rms} T_{JM}=125°C i^2t=16.2kA^2s t_q=180us R_{thJ-C}≤0.45°C/W T_{tight}=20Nm												
T63N 400	63	400	1600	25	2	200	200	2.3	500	400*	150	B-27
T63N 600		600										
T63N 800		800										
T63N 1000		1000										
T63N 1100		1100										
T63N 1200		1200										
T63N 1400		1400										
T63N 1600		1600										
T63N 1800		1800										
180 A_{rms} T_{JM}=125°C i^2t=26.45kA^2s t_q=180us R_{thJ-C}≤0.35°C/W T_{tight}=20Nm												
T80N 400	80	400	2300#	25	2	200	200	2.1	500	400*	150	B-27
T80N 600		600										
T80N 800		800										
T80N 1000		1000										
T80N 1100		1100										
T80N 1200		1200										
T80N 1400		1400										
T80N 1600		1600										
T80N 1800		1800	# T_J=45°C									
200 A_{rms} T_{JM}=125°C i^2t=36.45kA^2s t_q=180us R_{thJ-C}≤0.27°C/W T_{tight}=20Nm												
T100N 400	100	400	2.7	25	2	200	200	1.95#	500	400*	150	B-27
T100N 600		600										
T100N 800		800										
T100N 1000		1000										
T100N 1100		1100										
T100N 1200		1200										
T100N 1400		1400										
T100N 1600		1600										
T100N 1800		1800						# T_J=T_{JM}				
280 A_{rms} T_{JM}=125°C i^2t=22.05kA^2s t_q=180us R_{thJ-C}≤0.14°C/W F_{clamp}=3-4.5kN												
T158N 400	160	400	2.1	25	2	250	300	2.05#	500	400*	150	T-20
T158N 600		600										
T158N 800		800										
T158N 1000		1000										
T158N 1100		1100										
T158N 1200		1200										
T158N 1400		1400										
T158N 1600		1600										
T158N 1800		1800						# T_J=T_{JM}				

Note: (*) Different dv/dt groups : C=400 V/us ; F=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

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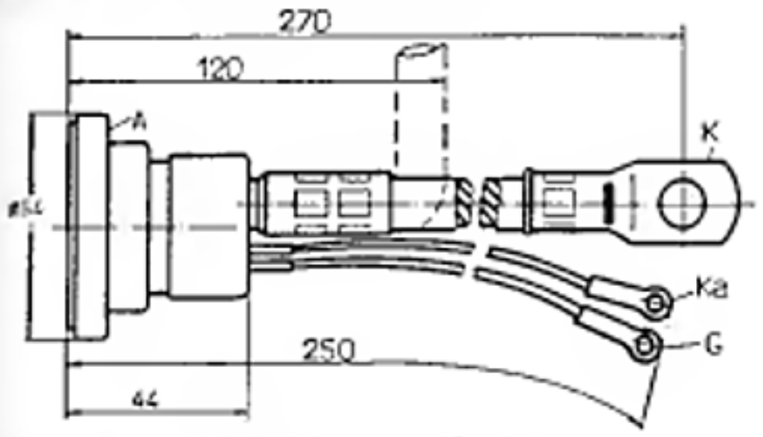
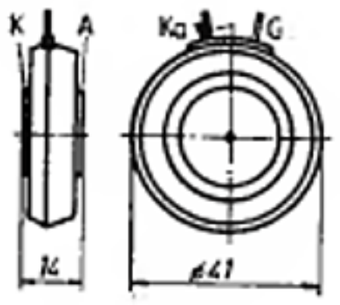
MAINS FREQUENCY THYRISTORS



CASES : E-50



T-20

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	(A)	$\frac{dv}{dt}$ min. (V/us)	$\frac{di}{dt}$ max. (A/us)	CASE STYLE
320 A_{rms} T_{JM}=125°C i^2t=26.45kA^2s t_q=180us R_{thJ-C}≤0.11°C/W F_{clamp}=3-4.5kN												
T198N 400	200	400	2.3	25	2	250	300	1.50	500	400*	150	T-20
T198N 600		600										
T198N 800		800										
T198N 1000		1000										
T198N 1100		1100										
T198N 1200		1200										
T198N 1400		1400										
T198N 1600		1600										
T198N 1800		1800										
400 A_{rms} T_{JM}=125°C i^2t=120kA^2s t_q=250us R_{thJ-C}≤0.12°C/W F_{clamp}=5.5kN												
T200N 200	200	200	4.9	80	2	200	300	2.07	1000	400*	150	E-50
T200N 400		400										
T200N 600		600										
T200N 800		800										
T200N 1000		1000										
T200N 1100		1100										
T200N 1200		1200										
T200N 1400		1400										
T200N 1600		1600										
T200N 1800		1800										
450 A_{rms} T_{JM}=125°C i^2t=101kA^2s t_q=250us R_{thJ-C}≤0.12°C/W F_{clamp}=5.5kN												
T200N 2000	220	2000	4.5	80	2	200	300	1.82#	600	400*	150	E-50
T200N 2200		2200										
T200N 2400		2400										
T200N 2600		2600										
							# T_J=T_{JM}					
450 A_{rms} T_{JM}=125°C i^2t=130kA^2s t_q=250us R_{thJ-C}≤0.12°C/W F_{clamp}=5.5kN												
T250N 200	250 #	200	5.1	80	2	200	300	1.86	1000	400*	150	E-50
T250N 400		400										
T250N 600		600										
T250N 800		800										
T250N 1000		1000										
T250N 1100		1100										
T250N 1200		1200										
T250N 1400		1400										
T250N 1600		1600										
T250N 1800		1800										
# T_C=78°C												

Note: (*) Different dv/dt groups : B=50 V/us (T200N, T250N only) ; C=400 V/us ; F=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

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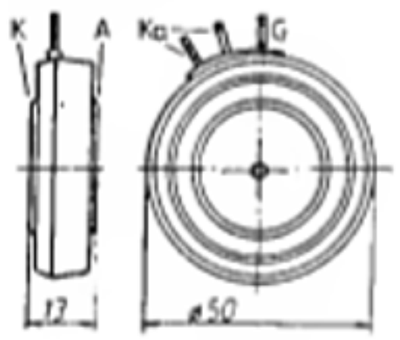
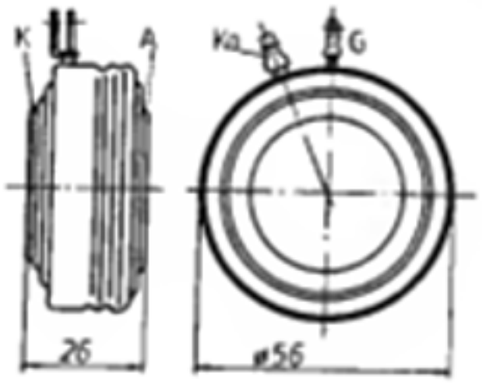
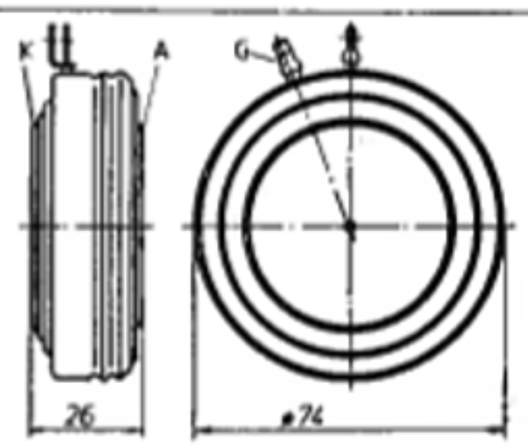
MAINS FREQUENCY THYRISTORS







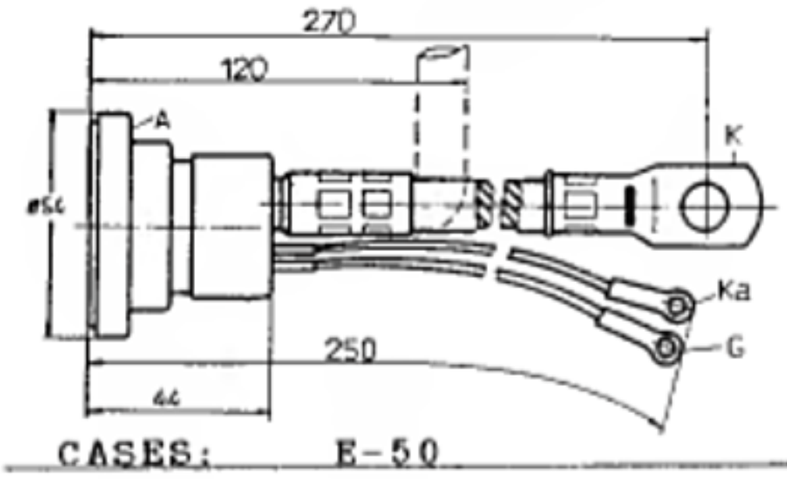
CASES: T-28 T-30 T-50

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V) (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
1100A$_{rms}$ T_{JM}=125°C i^2t=281kA^{2}s t_q=350us R_{thJ-C}≤0.045°C/W F_{clamp}=12-15kN											
T501N 1600	500	1600	7.5	80	1.5	250	300	1.80 1200	400*	120	T-30
T501N 1800		1800									
T501N 2000		2000									
T501N 2200		2200									
T501N 2400		2400									
T501N 2600		2600									
800A$_{rms}$ T_{JM}=125°C i^2t=238kA^{2}s t_q=250us R_{thJ-C}≤0.061°C/W F_{clamp}=5.5-8kN											
T508N 400	510	400	6.9	50	2	200	300	1.80 1600	400*	120	T-28
T508N 600		600									
T508N 800		800									
T508N 1000		1000									
T508N 1200		1200									
T508N 1400		1400									
T508N 1600		1600									
T508N 1800		1800									
1500A$_{rms}$ T_{JM}=125°C i^2t=845kA^{2}s t_q=350us R_{thJ-C}≤0.085°C/W F_{clamp}=14-18kN											
T700N 1500	700	1500	13	100	1.5	300	600	1.80 1200	400*	50	T-50
T700N 1800		1800									
T700N 2000		2000									
T700N 2200		2200									
T700N 2400		2400									
T700N 2600		2600									
1800A$_{rms}$ T_{JM}=125°C i^2t=1445kA^{2}s t_q=300us R_{thJ-C}≤0.025°C/W F_{clamp}=15-20kN											
T1000N 400	1000	400	17	80	2	250		1.30 1200	400*	50	T-50
T1000N 600		600									
T1000N 800		800									
T1000N 1000		1000									
T1000N 1200		1200									
T1000N 1400		1400									
T1000N 1600		1600									
T1000N 1800		1800									

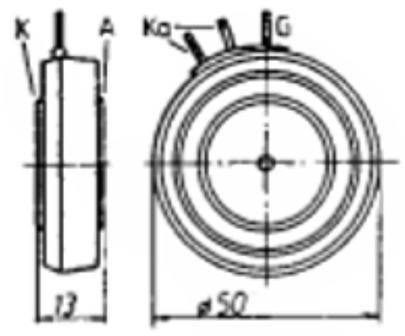
Note: (*) Different dv/dt groups : C = 400 V/us ; F = 1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

MAINS FREQUENCY THYRISTORS

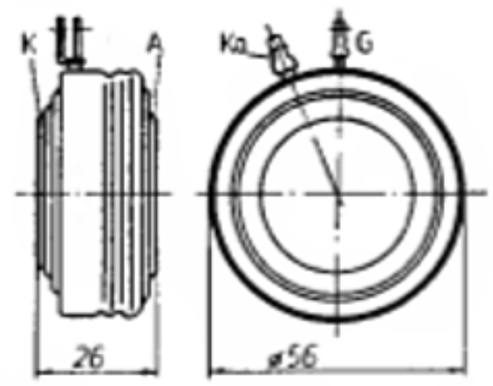
BANEASA S.A.



CASES: E-50



T-28



T-30

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} (V)	@ I_{TM} (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
500 A_{rms} T_{JM}=125°C i^2t=156kA^2s t_q=250us R_{thJ-C}≤0.08°C/W F_{clamp}=5.5kN												
T320N 200	320	200	5.6	80	2	200	300	1.7	1000	400*	150	E-50
T320N 400		400										
T320N 600		600										
T320N 800		800										
T320N 1000		1000										
T320N 1100		1100										
T320N 1200		1200										
T320N 1400		1400										
T320N 1600		1600										
T320N 1800		1800										
550 A_{rms} T_{JM}=125°C i^2t=192kA^2s t_q=250us R_{thJ-C}≤0.08°C/W F_{clamp}=5.5kN												
T350N 200	350	200	6.2	80	2	200	300	1.56#	1000	400*	150	E-50
T350N 400		400										
T350N 600		600										
T350N 800		800										
T350N 1000		1000										
T350N 1100		1100										
T350N 1200		1200										
T350N 1400		1400										
T350N 1600		1600										
T350N 1800		1800										
# T_J=T_{JM}												
730A_{rms} T_{JM}=125°C i^2t=205kA^2s t_q=220us R_{thJ-C}≤0.061°C/W F_{clamp}=5.5-8kN												
$ T388N 400	388	400	6.4	50	2	200	300	1.9	1500	1000*	120	T-28
$ T388N 600		600										
$ T388N 800		800										
$ T388N 1000		1000										
$ T388N 1100		1100										
$ T388N 1200		1200										
$ T388N 1400		1400										
$ T388N 1600		1600										
# T_J=T_{JM}												

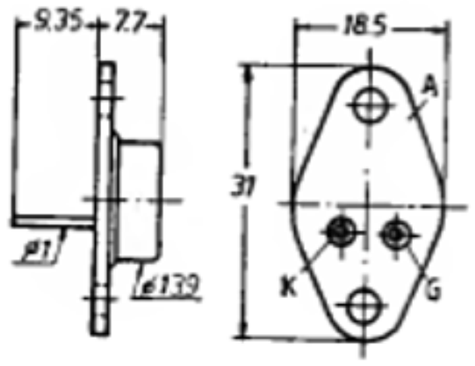
$ Preliminary Data

1000A_{rms} T_{JM}=125°C i^2t=228kA^2s t_q=350us R_{thJ-C}≤0.045°C/W F_{clamp}=12-15kN												
T455N 1600	455	1600	6.75	80	1.5	250	300	2.1	1200	400*	120	T-30
T455N 1800		1800										
T455N 2000		2000										
T455N 2200		2200										
T455N 2400		2400										
T455N 2600		2600										

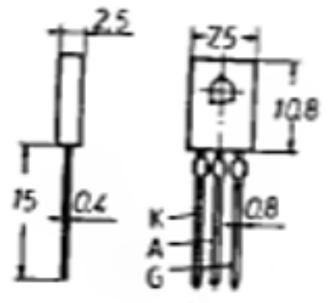
Note: (*) Different dv/dt groups : B=50 V/us (T320N, T350N only) ; C=400 V/us ; F=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

FAST SWITCHING THYRISTORS

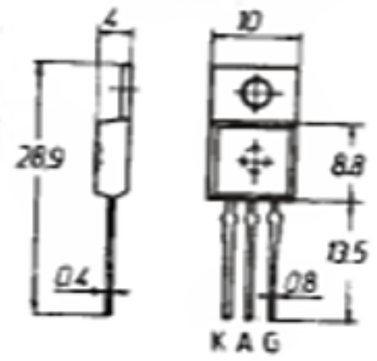
BANEASA S.A.



CASES: F-22



TO-126 (SOT-32)



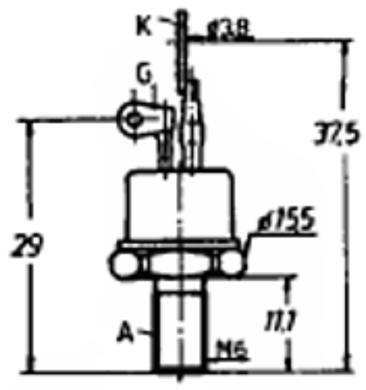
TO-220

TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	@ I_{TM} (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
1.6 A_{rms} T_{JM}=125°C i^2t=0.5A^2s t_q=10us R_{thJ-C}≤30°C/W												
T1F 05	1 #	50	10	1	2	10	20	2	3	50+		TO-126
T1F 1		100										
T1F 2		200										
T1F 4		400										
T1F 6		600										
T1F 8		800										
	# T_C=100°C											
4.7 A_{rms} T_{JM}=125°C i^2t=4.5A^2s t_q=10us R_{thJ-C}≤4°C/W												
T3F 05	3 #	50	30	1.5	3	50	150	2.5	10	50+	50	F-22
T3F 1		100										
T3F 2		200										
T3F 4		400										
T3F 6		600										
T3F 8		800										
	# T_C=100°C											
4.7 A_{rms} T_{JM}=100°C i^2t=4.5A^2s t_q=20us R_{thJ-C}≤4°C/W												
T3F 05P	3 #	50	30	0.5	2	30	50	2.7	10	50		TO-220
T3F 1P		100										
T3F 2P		200										
T3F 3P		300										
T3F 4P		400										
T3F 5P		500										
T3F 6P		600										
	# T_C=70°C											
9.4 A_{rms} T_{JM}=100°C i^2t=18A^2s t_q=20us R_{thJ-C}≤2.6°C/W												
T6F 05P	6 #	50	60	0.5	2	30	50	2	18	50		TO-220
T6F 1P		100										
T6F 2P		200										
T6F 3P		300										
T6F 4P		400										
T6F 5P		500										
T6F 6P		600										
$ T6F 7P		700										
$ T6F 8P		800										
$ Prelimin.data	# T_C=70°C											

Note: (+) Different dv/dt groups : B=50 V/us ; C=100V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

BANEASA S.A.

FAST SWITCHING THYRISTORS



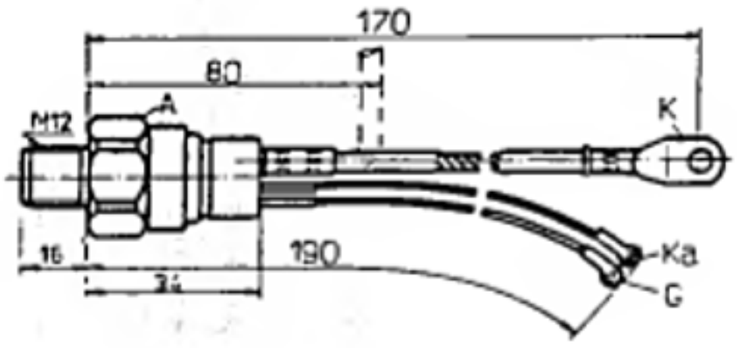
CASE : TO-48

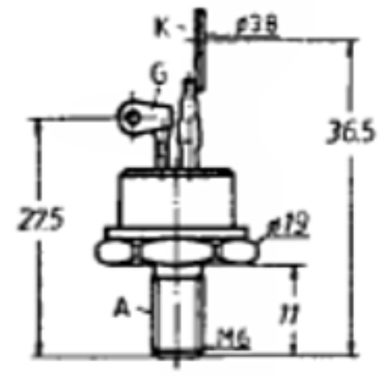
TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	(A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
16 A_{rms} T_{JM}=125°C i^2t=50A^2s t_q=20us R_{thJ-C}≤2°C/W												
T10F 05	10 #	50	100	5	2	100	120	2.2	30	50+	100	TO-48
T10F 1		100										
T10F 2		200										
T10F 3		300										
T10F 4		400										
T10F 5		500										
T10F 6		600										
T10F 7		700										
T10F 8		800										
T10F 9		900										
T10F 10		1000										
T10F 11		1100										
T10F 12		1200										
	# T_C=75°C											
25 A_{rms} T_{JM}=125°C i^2t=112A^2s t_q=20us R_{thJ-C}≤1.5°C/W												
T16F 05	16 #	50	150	5	2	100	120	2.2	50	50+	100	TO-48
T16F 1		100										
T16F 2		200										
T16F 3		300										
T16F 4		400										
T16F 5		500										
T16F 6		600										
T16F 7		700										
T16F 8		800										
T16F 9		900										
T16F 10		1000										
T16F 11		1100										
T16F 12		1200										
	# T_C=75°C											
34 A_{rms} T_{JM}=125°C i^2t=312A^2s t_q=20us R_{thJ-C}≤1.1°C/W												
T22F 05	22	50	250	5	2	100	200	2.2	70	50+	100	TO-48
T22F 1		100										
T22F 2		200										
T22F 3		300										
T22F 4		400										
T22F 5		500										
T22F 6		600										
T22F 7		700										
T22F 8		800										
T22F 9		900										
T22F 10		1000										
T22F 11		1100										
T22F 12		1200										

Note: (+) Different dv/dt groups : B=50 V/us ; C=100V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

FAST SWITCHING THYRISTORS

BANEASA S.A.





DO-5Ty

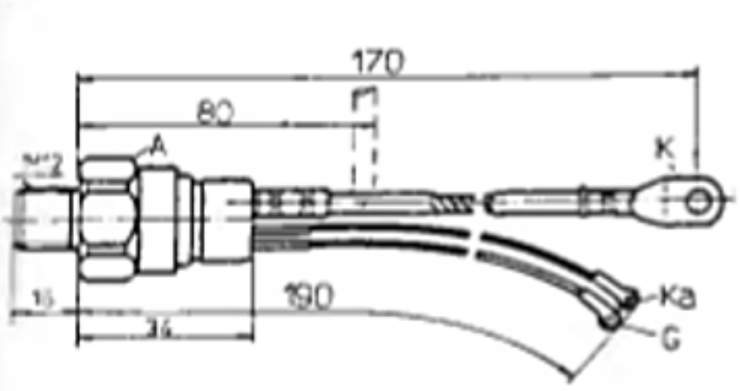
CASES: B-27

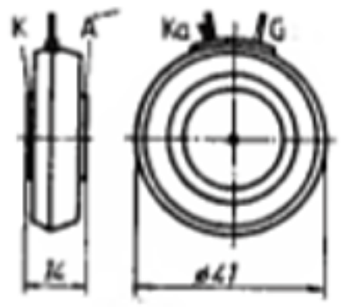
TYPE	I_{TAVM} (A)	V_{RRM}= V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM}= I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} (V)	@ I_{TM} (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
37 A_{rms} T_{JM}=125°C i^2t=700A^2s t_q=20us R_{thJ-C}≤0.84°C/W												
T25F 1	25	100	375	10	1.5	150		2.1	75	50+	50	DO-5Ty
T25F 2		200										
T25F 3		300										
T25F 4		400										
T25F 5		500										
T25F 6		600										
T25F 7		700										
T25F 8		800										
T25F 9		900										
T25F 10		1000										
T25F 11		1100										
T25F 12		1200										
45 A_{rms} T_{JM}=125°C i^2t=1000A^2s t_q=20us R_{thJ-C}≤0.84°C/W												
T30F 1	30	100	450	10	1.5	150		1.8	90	50+	50	DO-5Ty
T30F 2		200										
T30F 3		300										
T30F 4		400										
T30F 5		500										
T30F 6		600										
T30F 7		700										
T30F 8		800										
T30F 9		900										
T30F 10		1000										
T30F 11		1100										
T30F 12		1200										
140 A_{rms} T_{JM}=125°C i^2t=9.8kA^2s t_q=30us-18us(#) R_{thJ-C}≤.417°C/W T_{tight}=20Nm												
T50F 200	50	200	1400	30	2	200	250	2.3	200	50*	150	B-27
T50F 400		400										
T50F 600		600										
T50F 800		800										
T50F 1000		1000										
T50F 1100		1100										
T50F 1200		1200										
T50F 1300		1300										
160 A_{rms} T_{JM}=125°C i^2t=9.8kA^2s t_q=40us-18us(#) R_{thJ-C}≤.344°C/W T_{tight}=20Nm												
T63F 200	63	200	1400	30	2	200	250	2.05	200	50*	150	B-27
T63F 400		400										
T63F 600		600										
T63F 800		800										
T63F 1000		1000										
T63F 1100		1100										
T63F 1200		1200										
T63F 1300		1300										

Notes: (+) Different dv/dt groups : B=50 V/us ; C=100V/us ; D=200 V/us ; G=500 V/us ; K=1000 V/us.
(*) Different dv/dt groups : B=50 V/us ; C=100V/us ; L=400 V/us ; M=1000 V/us.
(#) Different t_q classes : S=18us ; E=20us ; F=25us ; G=30us ; K=40us ; M=50us ; N=60us.
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

BANEASA S.A.

FAST SWITCHING THYRISTORS





CASES: B-27 E-50 T-20

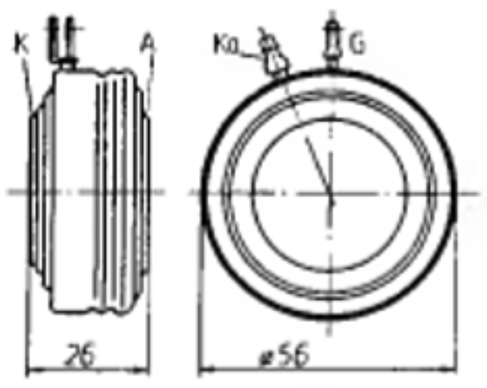
TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V) (A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
180 A_{rms} T_{JM}=125°C i^2t=22.1kA^2s t_q=40-18us(#) R_{thJ-C}≤.271°C/W T_{tight}=20Nm											
T80F 200	80	200	2100	30	2	200	250	1.85 200	50*	150	B-27
T80F 400		400									
T80F 600		600									
T80F 800		800									
T80F 1000		1000									
T80F 1100		1100									
T80F 1200		1200									
T80F 1300		1300									
400A_{rms} T_{JM}=125°C i^2t=27.6kA^2s t_q=60-20us(#) R_{thJ-C}≤0.117°C/W F_{clamp}=3-4.5kN											
$ T158S 200	160	200	2350	30	2.2	250	250	2.75 600	50*	500	T-20
$ T158S 400		400									
$ T158S 600		600									
$ T158S 800		800									
$ T158S 1000		1000									
$ T158S 1200		1200									
$ T158S 1300		1300									
$ T158S 1400		1400									
450 A_{rms} T_{JM}=125°C i^2t=160kA^2s t_q=30-18us(#) R_{thJ-C}≤.12°C/W F_{clamp}=5.5kN											
T195F 200	195	200	6000	60	2.2	250	250	2.05 500	50*	200	E-50
T195F 400		400									
T195F 600		600									
T195F 800		800									
T195F 900		900									
T195F 1000		1000									
T195F 1100		1100									
T195F 1200		1200									
T195F 1300		1300									
550 A_{rms} T_{JM}=125°C i^2t=205kA^2s t_q=30-18us(#) R_{thJ-C}≤.08°C/W F_{clamp}=5.5kN											
T290F 200	290	200	6400	50	2.2	250	250	1.90 500	50*	200	E-50
T290F 400		400									
T290F 600		600									
T290F 800		800									
T290F 1000		1000									
T290F 1100		1100									
T290F 1200		1200									
T290F 1300		1300									

$ Preliminary data

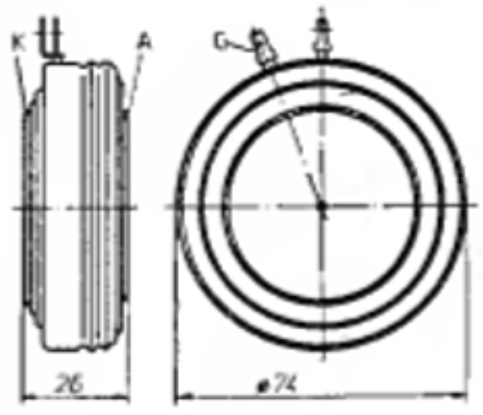
Notes: (*) Different dv/dt groups : B=50 V/us ; C=100V/us ; L=400 V/us ; M=1000 V/us.
(#) Different t_q classes : S=18us ; E=20us ; F=25us ; G=30us ; K=40us ; M=50us ; N=60us.
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

FAST SWITCHING THYRISTORS

BANEASA S.A.



T-30



T-50

CASES:

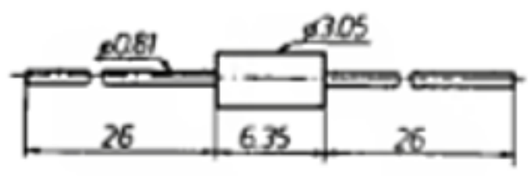
TYPE	I_{TAVM} (A)	V_{RRM} = V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM} = I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	(A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
1500A$_{rms}$ T_{JM}=125°C i^2t=500kA^{2}s t_q=40-20us(#) R_{thJ-C}≤.0385°C/W F_{clamp}=12-15kN												
T600F 400	600	400	10000	100	2.2	250	300	1.9^	1200	50*	200	T-30
T600F 600		600										
T600F 800		800										
T600F 1000		1000										
T600F 1100		1100										
T600F 1200		1200										
T600F 1300		1300										
								^ T_J=T_{JM}				
1500A$_{rms}$ T_{JM}=125°C i^2t=461kA^{2}s t_q=60-40us(#) R_{thJ-C}≤.029°C/W F_{clamp}=14-20kN												
T630S 1400	968 #	1400	9600	100	2.2	250	300	2.5^	1200	50*	300	T-50
T630S 1600		1600										
T630S 1800		1800										
T630S 2000		2000										
	# T_C=50°C							^ T_J=T_{JM}				

#)

Notes: (*) Different dv/dt groups : B=50 V/us ; C=100V/us ; L=400 V/us ; M=1000 V/us.
(#) Different t_q classes : S=18us ; E=20us ; F=25us ; G=30us ; K=40us ; M=50us ; N=60us.
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

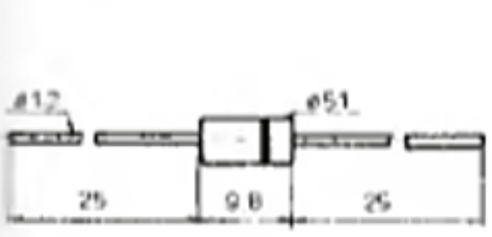
DIACS

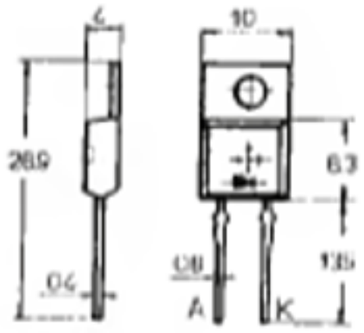
TYPE	V_{B01}-V_{B02} min.- max. (V)	I_{B01}= =I_{B02} max. (uA)	V_{B0} max. (V)	V_{S1}= =V_{S2} min. (V)	I_{TRM} (A)	P_d max. (W)	T_{JM} (°C)	CASE STYLE
DC 32	28 - 36	300	4	5	1.5	0.3	125	F-126 (White band near cathode)
DC 32A		50	2	5				
DC 38	34 - 42	300	4	5				
DC 38A		50	2	5				
DC 44	40 - 48	300	4	7				
DC 44A		50	2	7				
DC 50	46 - 54	300	4	7				
DC 50A		50	2	7				

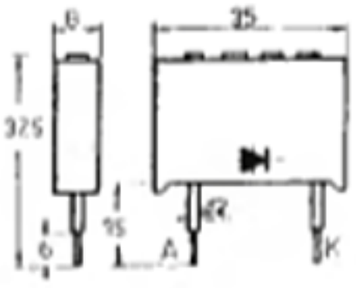


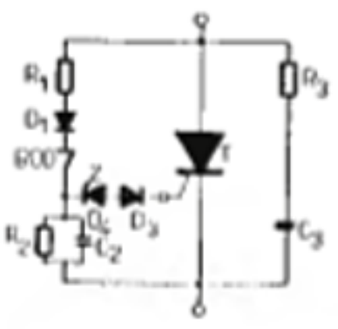
BOD (THYRISTOR-DIODE)

The BOD Series are semiconductor devices designed to be used as thyristor protection against overvoltage in foreward conduction.









CASES: DO-27 TO-220 3PM TYPICAL APPLICATION

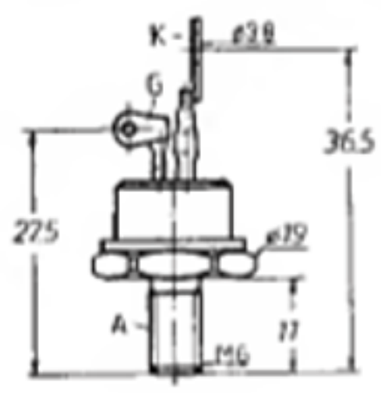
Speed performances : dv/dt(exp) = 1000 V/us ; @ T_{VJ} = 50°C, V_D = 0.67 x (V_{BO} + 100V)
di/dt = 2000 A/us ; @ T_{VJ} =125°C, V_D = V_{BO}, I_T = 800A

TYPE	V_{BO}+ $\triangle V_{BO}$ (V)	I_{TAVM} (1) (A)	I_D (2) (uA)	I_R (3) (uA)	V_{RRM} (V)	I_{TSM} (4) (A)	I_{TRMS} (1) (A)	I_{BO} (mA)	@ V_{TM} (V)	CASE STYLE
$ BOD 1-04	400 + 50	0.9	100	-	-	200	1.4	15	1.7	
$ BOD 1-05	500 + 50	0.9	100	-	-	200	1.4	15	1.7	DO-27
$ BOD 1-06	600 + 50	0.9	100	-	-	200	1.4	15	1.7	(TO-220 by
$ BOD 1-07	700 + 50	0.9	100	-	-	200	1.4	15	1.7	request)
$ BOD 1-08	800 + 50	0.9	100	-	-	200	1.4	15	1.7	
$ BOD 1-09	900 + 50	0.9	100	-	-	200	1.4	15	1.7	
$ BOD 1-10	1000 + 50	0.9	100	-	-	200	1.4	15	1.7	
$ BOD 1-11	1100 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-12	1200 + 50	1.25	200	200	-	200	2.0	15	3.4	3 PM
$ BOD 1-13	1300 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-14	1400 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-15	1500 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-16	1600 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-17	1700 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-18	1800 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-19	1900 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-20	2000 + 50	1.25	200	200	-	200	2.0	15	3.4	
$ BOD 1-11/D	1100 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-12/D	1200 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-13/D	1300 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-14/D	1400 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-15/D	1500 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-16/D	1600 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-17/D	1700 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-18/D	1800 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-19/D	1900 + 50	1.25	200	200	2000	50	0.3	15	33	
$ BOD 1-20/D	2000 + 50	1.25	200	200	2000	50	0.3	15	33	

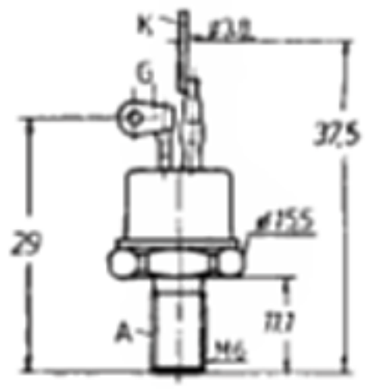
$ Preliminary data

Notes : (1) T_A=50°C ; f=50Hz
(2) T_{VJ}=125°C ; V_D=0.8 x V_{BO}
(3) T_{VJ}=125°C ; V_R=V_{RRM}
(4) T_A=50°C ; t_i=0.1ms

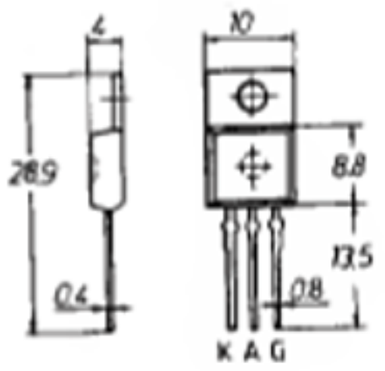
BANEASA S.A.



DO-5Ty



TO-48



TO-220

CASES :

TYPE	I_{TRMS} (A)	V_{RRM}= V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM}= I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C $\pm V_{GT}$ max. (V)	$\pm I_{GT}$ max. (mA)	$\pm I_H$ max. (mA)	$\pm V_{TM}$ (V)	@ $\pm I_{TM}$ (A)	dv/dt min. (V/µs)	di/dt max. (A/µs)	CASE STYLE
6 A_{rms} T_{JM}= 115°C i^2t= 11.5A^2s $R_{thJ-C}\leq$ 3.0°C/W												
TB6N 2	6 #	200	48	0.5	2.5	100	100	2.3	8.5	5	50	TO-220
TB6N 3		300										
TB6N 4		400										
TB6N 5		500										
TB6N 6		600										
	# T_C=80°C											
10 A_{rms} T_{JM}= 115°C i^2t= 32A^2s $R_{thJ-C}\leq$ 2.4°C/W												
TB10N 2	10 #	200	80	0.5	2.5	100	100	1.9	14	5	50	TO-220
TB10N 3		300										
TB10N 4		400										
TB10N 5		500										
TB10N 6		600										
	# T_C=80°C											
16 A_{rms} T_{JM}= 125°C i^2t= 40A^2s $R_{thJ-C}\leq$ 2°C/W												
TB16N 05	16 #	50	90	3	3	100	100	2.0	23	5		TO-48
TB16N 1		100										
TB16N 2		200										
TB16N 4		400										
TB16N 6		600										
	# T_C=75°C											
25 A_{rms}/T_C= 75°C T_{JM}= 125°C i^2t= 315A^2s $R_{thJ-C}\leq$ 2°C/W												
TB25N 05	25 #	50	250	3	3	100	100	2.0	40	5		DO-5Ty
TB25N 1		100										
TB25N 2		200										
TB25N 4		400										
TB25N 6		600										
TB25N 8		800										
TB25N 9		900										
TB25N 10		1000										
TB25N 11		1100										
TB25N 12		1200										
	# T_C=75°C											

Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; $T_J = T_{JM}$; dv/dt @ 67% V_{DRM} & T_{JM}.

T R A N S I S T O R S

Alphanumeric Index _____ page 72

SMALL SIGNAL TRANSISTORS

General Purpose _____ page 73

Special Types _____ page 74

POWER TRANSISTORS

General Purpose _____ page 77

Switching _____ page 81

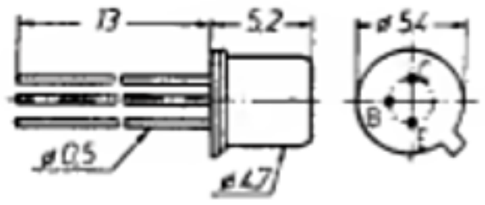
ALPHANUMERIC INDEX

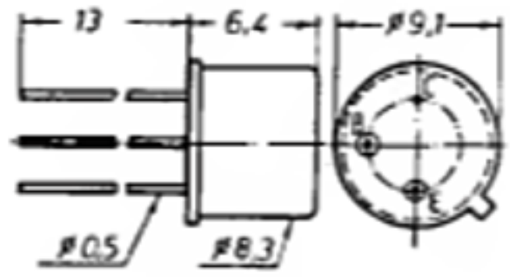
BC 107.....73
BC 108.....73
BC 109.....73
BC 170.....74
BC 171.....74
BC 172.....74
BC 173.....74
BC 174.....74
BC 177.....73
BC 178.....73
BC 179.....73
BC 190.....73
BC 237.....74
BC 238.....74
BC 239.....74
BC 250.....74
BC 251.....74
BC 252.....74
BC 253.....74
BC 256.....74
BC 261.....73
BC 262.....73
BC 263.....73
BC 266.....73
BC 307.....74
BC 308.....74
BC 309.....74
BC 327.....75
BC 328.....75
BC 337.....75
BC 338.....75
BC 413.....74
BC 414.....74
BC 415.....74
BC 416.....74
BC 516.....75
BC 517.....75
BC 546.....74
BC 547.....74
BC 548.....74
BC 549.....74
BC 550.....74
BC 556.....74
BC 557.....74
BC 558.....74
BC 559.....74
BC 560.....74
BCY 58.....73
BCY 59.....73
BCY 69.....73
BCY 78.....73
BCY 79.....73
BD 135.....77
BD 136.....77
BD 137.....77
BD 138.....77
BD 139.....77
BD 140.....77
BD 142.....77
BD 181.....77
BD 182.....77
BD 183.....77
BD 233.....77
BD 234.....77
BD 235.....77
BD 236.....77
BD 237.....77
BD 238*.....77
BD 239*.....77
BD 240*.....77
BD 241*.....77
BD 242*.....77
BD 243*.....77
BD 244*.....77
BD 433.....77
BD 434.....77
BD 435.....77
BD 436.....77
BD 437.....77
BD 438.....77
BD 439.....77
BD 440.....77
BD 441.....77
BD 442.....77
BD 533.....77
BD 534.....77
BD 535.....77
BD 536.....77
BD 537.....77
BD 538.....77
BD 643.....79
BD 644.....79
BD 645.....79
BD 646.....79
BD 647.....79
BD 648.....79
BD 649.....79
BD 650.....79
BD 651.....79
BD 652.....79
BD 675*.....79
BD 676*.....79
BD 677*.....79
BD 678*.....79
BD 679*.....79
BD 680*.....79
BD 681*.....79
BD 682*.....79
BD 705.....77
BD 706.....77
BD 707.....77
BD 708.....77
BD 709.....77
BD 710.....77
BD 711.....77
BD 712.....77
BD 905.....77
BD 906.....77
BD 907.....77
BD 908.....77
BD 909.....77
BD 910.....77
BD 911.....77
BD 912.....77
BDX 33.....79
BDX 34.....79
BDX 53.....79
BDX 54.....79
BDX 62*.....80
BDX 63*.....80
BDX 64*.....80
BDX 65*.....80
BDX 66*.....80
BDX 67*.....80
BDY 29.....77
BDY 37.....77
BDY 71.....77
BF 115.....75
BF 167.....75
BF 173*.....75
BF 180.....75
BF 181.....75
BF 184.....75
BF 185.....75
BF 198.....75
BF 199.....75
BF 200.....75
BF 214.....75
BF 215.....75
BF 240.....75
BF 241.....75
BF 245*.....76
BF 247*.....76
BF 254.....75
BF 255.....75
BF 256*.....76
BF 257*.....74
BF 258.....74
BF 259.....74
BF 272A.....75
BF 272B.....75
BF 297.....74
BF 298.....74
BF 299.....74
BF 316A.....75
BF 420A.....74
BF 421A.....74
BF 422A.....74
BF 423A.....74
BF 450.....75
BF 451.....75
BF 457*.....74
BF 458.....74
BF 459.....74
BF 469.....74
BF 470.....74
BF 471.....74
BF 472.....74
BF 479.....75
BF 506.....75
BF 509.....75
BF 914.....75
BFW 94.....75
BFX 89.....75
BFY 90.....75
BSV 15.....73
BSV 16.....73
BSV 17.....73
BSV 89.....76
BSV 90.....76
BSV 91.....76
BSW 19A*.....73
BSW 21*.....73
BSW 22*.....73
BSX 12*.....76
BSX 21.....73
BSX 45.....73
BSX 46.....73
BSX 47.....73
BSX 51*.....73
BSX 52*.....73
BU 84X*.....82
BU 85X.....82
BU 204.....81
BU 205*.....81
BU 206.....81
BU 207.....81
BU 208*.....81
BU 209.....81
BU 326A*.....82
BU 406.....81
BU 406D.....81
BU 407.....81
BU 407D.....81
BU 408.....81
BU 408D.....81
$BU 426.....82
BU 505.....81
BU 506.....81
BU 508AF....82
BU 526*.....82
BU 606.....81
BU 606D.....81
BU 607.....81
BU 607D.....81
BU 608.....81
BU 608D.....81
BU 806.....81
BU 806R.....81
BU 807.....81
BU 807R.....81
BU 930.....81
BU 931.....81
BU 932.....81
BUP 23.....82
BUR 606.....81
BUR 606D....81
BUR 607.....81
BUR 607D....81
BUR 608.....81
BUR 608D....81
BUS 11*.....82
BUS 12*.....82
BUS 13*.....82
BUS 14*.....82
BUT 11*.....82
BUT 12*.....82
BUT 18*.....82
BUW 25*.....82
BUW 26.....82
BUX 10A.....82
BUX 11A.....82
BUX 12A.....83
BUX 40A.....83
BUX 41A.....83
BUX 42A.....83
BUX 80*.....83
BUX 81*.....83
BUX 82*.....83
BUX 83*.....83
BUX 84*.....83
BUX 85*.....83
BUX 86*.....83
BUX 87*.....83
MJE 13004...83
MJE 13005...83
MJE 13006...83
MJE 13007...83
MJE 13008...83
MJE 13009...83
MTR 4030....84
MTR 6030....84
MTR 8030....84
SDM 4001....80
SDM 4002....80
SDM 4003....80
SDM 4004....80
SDM 4005....80
SDM 4006....80
SDM 4010....80
SDM 4011....80
SDM 4012....80
SDM 4013....80
SDM 4014....80
SDM 4015....80
SDM 4016....80
SDM 4017....80
SDT 9201....77
SDT 9202....77
SDT 9203....77
SDT 9204....77
SDT 9205....77
SDT 9206....77
SDT 9207....77
SDT 9208....77
SDT 9209....77
SDT 9210.....77
SDT 9301.....77
SDT 9302.....78
SDT 9303.....78
SDT 9304.....78
SDT 9305.....78
SDT 9306.....78
SDT 9307.....78
SDT 9308.....78
SDT 9309.....78
TD 643.....80
TD 644.....80
TD 645.....80
TD 646.....80
TD 647.....80
TD 648.....80
TD 649.....80
TD 650.....80
TIP 29*.....78
TIP 30*.....78
TIP 31*.....78
TIP 32*.....78
TIP 41*.....78
TIP 42*.....78
TIP 100.....80
TIP 101.....80
TIP 102.....80
TIP 105.....80
TIP 106.....80
TIP 107.....80
TIP 110.....80
TIP 111.....80
TIP 112.....80
TIP 115.....80
TIP 116.....80
TIP 117.....80
TIP 120.....80
TIP 121.....80
TIP 122.....80
TIP 127.....80
TIP 130.....80
TIP 131.....80
TIP 132.....80
TIP 135.....80
TIP 136.....80
TIP 137.....80
TIP 140T....80
TIP 141T....80
TIP 142T....80
TIP 145T....80
TIP 146T....80
TIP 147T....80
2N 706.....76
2N 708.....76
2N 918.....75
2N 929.....73
2N 930.....73
2N 1487.....78
2N 1488.....78
2N 1489.....78
2N 1490.....78
2N 1613*.....73
2N 1711*.....73
2N 2217.....73
2N 2218*.....73
2N 2219*.....73
2N 2220.....73
2N 2221*.....73
2N 2222*.....73
2N 2368*.....76
2N 2369*.....76
2N 2890.....76
2N 2891.....76
2N 2904*.....73
2N 2905*.....73
2N 2906*.....73
2N 2907*.....73
2N 3054.....78
2N 3055*.....78
2N 3055H....78
2N 3055W....78
2N 3439.....74
2N 3440.....74
2N 3441.....78
2N 3442.....78
2N 3771.....78
2N 3772.....78
2N 3773.....78
2N 4347.....78
2N 4348.....78
2N 4957.....75
2N 4958.....75
2N 4959.....75
2N 4983.....76
2N 5020.....76
2N 5021.....76
2N 5109.....75
2N 5109.....75
2N 5109.....75
2N 5294.....78
2N 5296.....78
2N 5298.....78
2N 5415.....74
2N 5416.....74
2N 5490.....78
2N 5492.....78
2N 5494.....78
2N 5496.....78
2N 5829.....75
2N 5835.....75
2N 5836.....75
2N 5837.....75
2N 5871.....78
2N 5872*.....78
2N 5873*.....78
2N 5874*.....79
2N 5875*.....79
2N 5876*.....79
2N 5877*.....79
2N 5878*.....79
2N 6253.....79
2N 6254.....79
2N 6257.....79
2N 6258.....79
2N 6259.....79
2N 6260.....79
2N 6261.....79
2N 6262.....79
2N 6263.....79
2N 6264.....79
2N 6338A....79
2N 6339A....79
2N 6340A....79
2N 6341A....79
2N 6436A....79
2N 6437A....79
2N 6438A....79
2N 6371.....79
2N 6653*.....83
2N 6654*.....83
2N 6655*.....83

* The basic type has several extention (A, B, C, etc.)

BANEASA S.A.

GENERAL PURPOSE





CASES : TO-18a TO-39

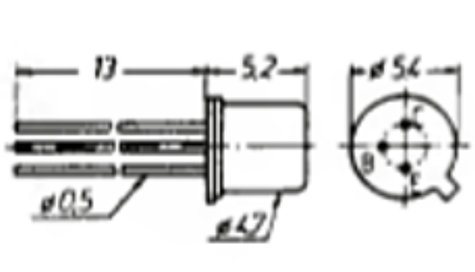
TYPE NPN	TYPE PNP	P_{tot} @ T_A=25°C (W)	V_{CBO} / V_{CES}" min. (V)	V_{CEO} min. (V)	I_C (mA)	h_{FE} / h_{fe} min.-max.	@ I_C (mA)	V_{CEsat} max. (V)	@ I_C (mA)	f_T min. (MHz)	NF max. (dB)	C_{ob} max. (pF)	CASE
BC 107		0.3	50 "	45	100	125-900	(1) 2	600	100	250	10	6	TO-18a
BC 108		0.3	30 "	20	100	125-900	(1) 2	600	100	250	10	6	TO-18a
BC 109		0.3	30 "	20	100	125-900	(1) 2	600	100	250	6	6	TO-18a
	BC 177	0.3	50	45	100	75-900	(1) 2	500	100	150	10	7	TO-18a
	BC 178	0.3	30	25	100	75-900	(1) 2	500	100	150	10	7	TO-18a
	BC 179	0.3	25	20	100	125-900	(1) 2	500	100	150	4	7	TO-18a
BC 190		0.3	70	64	100	125-500	(1) 2	600	100	250	10	6	TO-18a
	BC 261	0.3	50	45	100	75-900	(1) 2	500	500	130	10	6	TO-18a
	BC 262	0.3	30	25	100	75-900	(1) 2	500	500	130	10	6	TO-18a
	BC 263	0.3	25	20	100	125-900	(1) 2	500	500	130	4	6	TO-18a
	BC 266	0.3	64 "	64	100	125-500	(1) 2	500	100	130	10	6	TO-18a
BCY 58		1 #	32 "	32	200	125-700	(2) 2	350	10	125	-	6	TO-18a
BCY 59		1 #	45 "	45	200	125-700	(2) 2	350	10	125	-	6	TO-18a
BCY 69		0.3	20	20	100	455-650	2	250	10	150	6	8	TO-18a
	BCY 78	1 #	32 "	32	200	125-700	(2) 2	250	10	180	-	7	TO-18a
	BCY 79	1 #	45 "	45	200	125-700	(2) 2	250	10	180	-	7	TO-18a
	BSV 15	3.2 ^	40 "	40	1000	40-250	(3) 100	1000	500	50	-	30	TO-39
	BSV 16	3.2 ^	60 "	60	1000	40-250	(3) 100	1000	500	50	-	30	TO-39
	BSV 17	3.2 ^	80 "	80	1000	40-250	(3) 100	1000	500	50	-	25	TO-39
	BSW 19A	1 *	35	30	100	40-120	10	300	50	150	-	7	TO-18a
	BSW 19VI	1 *	35	30	100	100-300	10	300	50	150	-	7	TO-18a
	BSW 21	0.3	25	25	200	75-225	2	500	50	150	-	8	TO-18a
	BSW 21A	0.3	50	50	200	75-225	2	500	50	150	-	8	TO-18a
	BSW 22	0.3	25	25	200	180-540	2	500	50	150	-	8	TO-18a
	BSW 22A	0.3	50	50	200	180-540	2	500	50	150	-	8	TO-18a
BSX 21		0.3	120	80	50	20-	! 4	1800	10	6	-	3.6	TO-18a
BSX 45		5 *	80 "	40	1000	40-250	(3) 100	1000	1000	50	-	25	TO-39
BSX 46		5 *	100 "	60	1000	40-250	(3) 100	1000	1000	50	-	20	TO-39
BSX 47		5 *	120 "	80	1000	40-250	(3) 100	1000	1000	50	-	15	TO-39
BSX 51		0.3	25	25	200	75-250	2	300	50	300	-	8	TO-18a
BSX 51A		0.3	50	50	200	75-250	2	300	50	300	-	8	TO-18a
BSX 51B		0.3	60	60	200	75-250	2	300	50	300	-	8	TO-18a
BSX 52		0.3	25	25	200	180-540	2	300	50	300	-	8	TO-18a
BSX 52A		0.3	50	50	200	180-540	2	300	50	300	-	8	TO-18a
BSX 52B		0.3	60	60	200	180-540	2	300	50	300	-	8	TO-18a
2N 929		0.3	45	45	30	200-350	10	1000	10	180	4	8	TO-18a
2N 930		0.3	45	45	30	300-600	10	1000	10	180	4	8	TO-18a
2N 1613		0.8	75	50	500	40-120	150	500	150	60	12	25	TO-39
2N 1613A		0.8	100	60	500	40-120	150	500	150	60	12	25	TO-39
2N 1711		0.8	75	50	500	100-300	150	500	150	70	8	25	TO-39
2N 1711A		0.8	100	60	500	100-300	150	500	150	70	8	25	TO-39
2N 2217		3 *	60	30	800	20- 60	150	400	150	200	-	8	TO-39
2N 2218		3 *	60	30	800	45-120	150	400	150	250	-	8	TO-39
2N 2218A		3 *	75	40	800	40-120	150	300	150	250	-	8	TO-39
2N 2219		3 *	60	30	800	100-300	150	400	150	250	-	8	TO-39
2N 2219A		3 *	75	40	800	100-300	150	300	150	300	-	8	TO-39
2N 2220		1.55#	60	30	800	20- 60	150	400	150	200	-	8	TO-18a
2N 2221		1.55#	60	30	800	40-120	150	400	150	250	-	8	TO-18a
2N 2221A		1.55#	75	40	800	40-120	150	300	150	250	-	8	TO-18a
2N 2222		1.55#	60	30	800	100-300	150	400	150	250	-	8	TO-18a
2N 2222A		1.55#	75	40	800	100-300	150	300	150	250	-	8	TO-18a
	2N 2904	3 *	60	40	800	40-120	150	400	150	200	-	8	TO-39
	2N 2904A	3 *	60	60	800	40-120	150	400	150	200	-	8	TO-39
	2N 2905	3 *	60	40	800	100-300	150	400	150	200	-	8	TO-39
	2N 2905A	3 *	60	40	800	100-300	150	400	150	200	-	8	TO-39
	2N 2906	1.8 *	60	40	600	40-120	150	400	150	200	-	8	TO-18a
	2N 2906A	1.8 *	60	60	600	40-120	150	400	150	200	-	8	TO-18a
	2N 2907	1.8 *	60	40	600	100-300	150	400	150	200	-	8	TO-18a
	2N 2907A	1.8 *	60	60	600	100-300	150	400	150	200	-	8	TO-18a

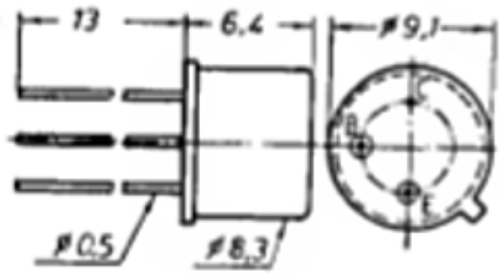
Notes: * $T_C \leq 25°C$
$T_C \leq 45°C$
^ $T_C \leq 60°C$

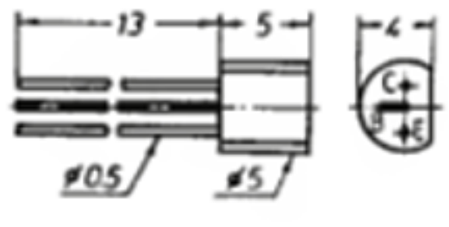
Different h_{fe} groups : (1) VI : 75-150 ; A : 125-260 ; B : 240-500 ; C : 450-900
(2) VII : 125-250; VIII: 175-350; IX: 250-500 ; X : 350-700
(3) 6 : 40-100 ; 10 : 63-160 ; 16: 100-250

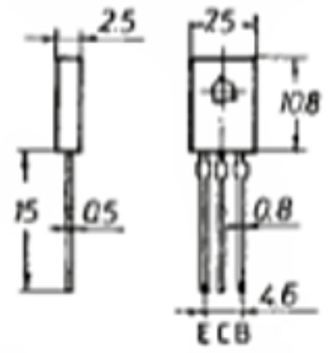
SPECIAL TYPES

BANEASA S.A.









CASES: TO-18a TO-39 TO-92a TO-126 (SOT-32)

LOW NOISE TRANSISTORS

TYPE NPN	TYPE PNP	P_{tot} (*) (W)	V_{CBO} V_{CES} min. (V)	V_{CEO} min. (V)	I_C (mA)	h_{fe} h_{FE} ! @ min.-max.	I_C (mA)	V_{CEsat} max. (mV)	@ I_C (mA)	f_T typ. (MHz)	NF max. (dB)	C_{ob} max. (pF)	CASE
BC 170		0.3	20 "	20	100	35- 600 (1)	1	400	30	250		6	TO-92a
BC 171		0.3	50 "	45	100	125-1000 (2)	2	600	100	250	10	6	TO-92a
BC 172		0.3	30 "	25	100	125-1000 (2)	2	600	100	250	10	6	TO-92a
BC 173		0.3	30 "	25	100	125- 900 (2)	2	600	100	250	4	6	TO-92a
BC 174		0.3	70 "	64	100	125- 500 (2)	2	600	100	250	10	6	TO-92a
BC 237		0.3	50 "	45	100	125-1000 (2)	2	600	100	250	10	6	TO-92a
BC 238		0.3	30 "	25	100	125- 900 (2)	2	600	100	250	10	6	TO-92a
BC 239		0.3	30 "	25	100	125- 900 (2)	2	600	100	250	4	6	TO-92a
	BC 250	0.3	20	20	100	35- 600 (1)	1	300	10	250	3	6	TO-92a
	BC 251	0.3	50 "	45	100	125- 900 (2)	2	300	10	250	10	6	TO-92a
	BC 252	0.3	30 "	25	100	125- 900 (2)	2	300	10	250	10	6	TO-92a
	BC 253	0.3	30 "	25	100	125- 900 (2)	2	300	10	250	4	6	TO-92a
	BC 256	0.3	64 "	64	100	125- 500 (2)	2	300	10	250	10	6	TO-92a
	BC 307	0.3	50 "	45	100	125- 900 (2)	2	500	100	250	10	6	TO-92a
	BC 308	0.3	30 "	25	100	125- 900 (2)	2	500	100	250	10	6	TO-92a
	BC 309	0.3	30 "	25	100	125- 900 (2)	2	500	100	250	3	6	TO-92a
BC 413	BC 415	0.3	45	30	100	240- 900 (2)	2	600	100	250	3	2.5	TO-92a
BC 414	BC 416	0.3	50	45	100	240- 900 (2)	2	600	100	250	3	2.5	TO-92a
BC 546	BC 556	0.3	80	65	100	125- 500 (2)	2	600	100	150	10	6	TO-92a
BC 547	BC 557	0.3	50	45	100	125- 500 (2)	2	600	100	150	10	6	TO-92a
BC 548	BC 558	0.3	30	30	100	125- 900 (2)	2	600	100	150	10	6	TO-92a
BC 549	BC 559	0.3	30	30	100	240- 900 (2)	2	600	100	150	4	6	TO-92a
BC 550	BC 560	0.3	50	45	100	240- 900 (2)	2	600	100	150	3	6	TO-92a

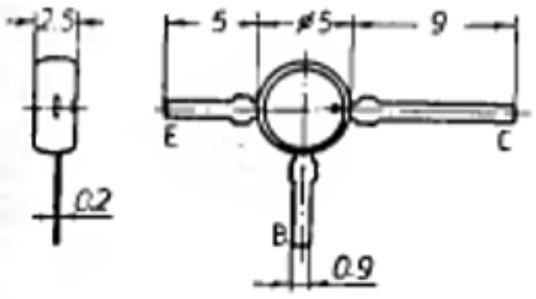
Different h_{fe} groups: (1) A: 35-100; B: 80-250; C: 200-600.
(2) A: 125-260; B: 240-500; C: 450-900/1000.

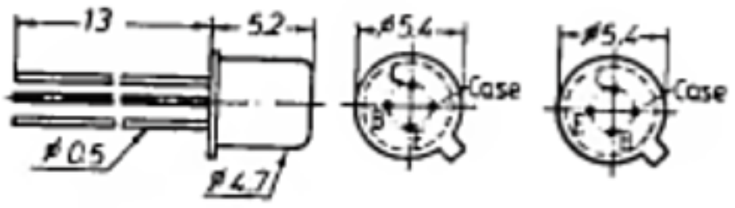
HIGH VOLTAGE & VIDEO AMPLIFIER TRANSISTORS

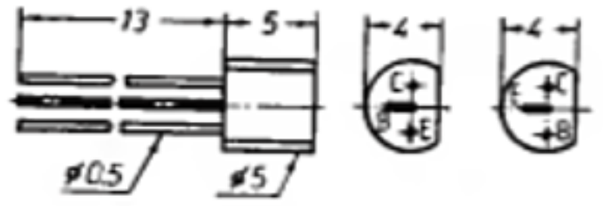
TYPE NPN	TYPE PNP	P_{tot} @ T_A=25°C (W)	V_{CEO} V_{CER}! min. (V)	I_C (mA)	@ I_C @ V_{CE} min.-max.	I_C (mA)	V_{CE} (V)	V_{CEsat} (mV)	@ I_C (mA)	& I_B (mA)	f_T min. (MHz)	C_{ob} max. (pF)	CASE
BF 257		0.8	160	100	25-	30	10	1000	30	6	50	4.7	TO-39
BF 257E		0.8	210	100	25-	30	10	1000	30	6	50	4.7	TO-39
BF 258		0.8	250	100	25-	30	10	1000	30	6	50	4.7	TO-39
BF 259		0.8	300	100	25-	30	10	1000	30	6	50	4.7	TO-39
BF 297		0.625*	160	100	25-	30	10	1000	30	6	50	5.5	TO-92a
BF 298		0.625*	250	100	25-	30	10	1000	30	6	50	5.5	TO-92a
BF 299		0.625*	300	100	25-	30	10	1000	30	6	50	5.5	TO-92a
BF 420A	BF 421A	0.83 #	300	25	40-	25	20				60	1.6	TO-92a
BF 422A	BF 423A	0.83 #	250	25	50-	25	20				60	1.6	TO-92a
BF 457		1.2	160	100	25-	30	10	1000	30	6	50	5.5	TO-126
BF 457E		1.2	210	100	25-	30	10	1000	30	6	50	5.5	TO-126
BF 458		1.2	250	100	25-	30	10	1000	30	6	50	5.5	TO-126
BF 459		1.2	300	100	25-	30	10	1000	30	6	50	5.5	TO-126
BF 469	BF 470	2 +	250	25	50-	25	20				60	1.8	TO-126
BF 471	BF 472	2 +	300!	25	40-	25	20				60	1.8	TO-126
$ 2N 3439		1 ^	350	1 k	40-160	20	10	500	50	4	15	10	TO-39
$ 2N 3440		1 ^	250	1 k	40-160	20	10	500	50	4	15	10	TO-39
$	2N 5415	1 ^	200	1 k	30-150	50	10	2500	50	5	15	10	TO-39
$	2N 5416	1 ^	300	1 k	30-120	50	10	2500	50	5	15	10	TO-39

$ Preliminary data

Notes : * With the leads kept at 25°C, at 2 mm near the case.
This value applies if the collector lead has max. 3 mm length and is soldered on a copper cooling area of minimum 10 mm x 10 mm and with a minimum thickness of 35 um.
+ $T_C \leq 110°C$
^ $T_A \leq 50°C$







CASES: TO-50 TO-72 a / b TO-92 a / b

HIGH FREQUENCY TRANSISTORS

TYPE NPN	TYPE PNP	FUNCTION	P_{tot} @ T_A=25°C (mW)	V_{CEO} min. (V)	I_C (mA)	f_T @ typ.* min. (MHz)	I_C max. (mA)	NF typ.* max. (dB)	NF @ I_C (mA)	NF & f_T (MHz)	G_p typ.* min. (dB)	CASE
BF 115		RF amp./mixer/osc.	165	30	30	150	1	1.2	1	1	-	TO-72b
BF 167		TV/IF AGC amp.	130	30	25	350	4	3	4	35	26	TO-72b
BF 173		TV/IF amplifier	200	25	25	550	5		7.2	36.6	26	TO-72b
BF 173S		TV/IF amplifier	200	25	25	900	7					TO-72b
BF 180		UHF AGC amplifier	200	20	20	700	2	7	2	800	12	TO-72a
BF 181		UHF osc./mixer	200	20	20	600	2	5	3	200	12	TO-72a
BF 184		AM/FM amplifier	165	30	30	250	1	6	1	100	-	TO-72b
BF 185		FM front-end tuner	165	30	30	250	1	6	1	100		TO-72b
BF 198		TV/IF AGC amplifier	300	32	25	265	4	3	4	35		TO-92b
BF 199		TV/IF amplifier	300	32	25	365	5					TO-92b
BF 200		VHF AGC amplifier	200	20	20	500*	2	8	3	200	22 *	TO-72a
BF 214		AM/FM amplifier	165	30	30	250	1	6	1	100	-	TO-72b
BF 215		AM/FM amplifier	165	30	30	250	1	6	1	100		TO-72b
BF 240		FM/IF amplifier	300	42	25	265	1					TO-92b
BF 241		FM/IF amplifier	300	42	25	265	1					TO-92b
BF 254		AM/IF amplifier	220	20	30	150	1					TO-92b
BF 255		FM amplifier/mixer	220	20	30	150	1					TO-92b
	BF 272A	UHF AGC amplifier	200	35	20	600	3	5	3	800	15	TO-72a
	BF 272B	UHF AGC amplifier	200	35	20	600	3	3	3	900	15	TO-72a
	BF 316A	UHF osc./mixer	200	35	20	600	3	5	3	800	12	TO-72a
	BF 450	VHF osc./mixer	300	35	30	375	1	2.5	3	200	-	TO-92b
	BF 451	VHF osc./mixer	300	35	30	375	1	2.5	3	200	-	TO-92b
	$ BF 479	UHF/VHF amp./mixer	170	25	50	2000*	10	3.5	3	800	-	TO-50
	BF 506	VHF osc./mixer	300	35	30	400*	3	3 *	3	200	17 *	TO-92a
	BF 509	VHF AGC amplifier	300	35	30	700*	3	2.5 *	3	200	17 *	TO-92a
	BF 914	UHF/VHF f.-end amp.	300	35	25	850*	2	3.5	2	200	15	TO-92a
BFX 89		UHF/VHF amplifier	200	15	25	1000	25	6.5	2	500	17.5	TO-72a
BFY 90		UHF/VHF amplifier	200	15	25	1300	25	5	2	500	19.5	TO-72a
$ BFW 94		UHF amplifier	700	20	150	3000*	100				9.5*	TO-50
2N 918		VHF low noise amp.	200	15	50	600	4	5	1.5	200	13.5	TO-72a
	2N 4957	UHF low noise amp.	200	20	30	1600*	10	2.6	2	450	-	TO-72a
	2N 4958	UHF low noise amp.	200	20	30	1500*	10	2.9	2	450	-	TO-72a
	2N 4959	UHF low noise amp.	200	20	30	1500*	10	3.2	2	450	-	TO-72a
2N 5109		UHF power amplifier	1000	20	400	1200	50	3 *	70	200	-	TO-39
2N 5109A		UHF power amplifier	1000	20	400	1000	50	3 *	70	200	-	TO-39
2N 5109B		UHF power amplifier	1000	20	400	800	50	3 *	70	200	-	TO-39
	2N 5829	UHF low noise amp.	200	20	30	1200*	10	2.5	2	450	-	TO-72a
2N 5835		UHF amplifier	200	10	15	2500	10				-	TO-72a
2N 5836		UHF amplifier	360	10	200	2000	50				-	TO-18a
$ 2N 5837		UHF amplifier	750	5	300	1700	100				-	TO-39

$ Preliminary data

COMPLEMENTARY TRANSISTOR PAIRS

TYPE NPN	TYPE PNP	P_{tot} (1) (mW)	V_{CES} min. (V)	V_{CEO} min. (V)	I_C (mA)	h_{fe} @ min.-max.	I_C (mA)	V_{CEsat} @ I_C max. (mV)	I_C (mA)	f_T typ. (MHz)	C_{ob} max. (pF)	CASE
BC 337	BC 327	625	50	45	800	100-630 (2)	100	700	500	100	12	TO-92a
BC 338	BC 328	625	30	20	800	100-630 (2)	100	700	500	100	12	TO-92a

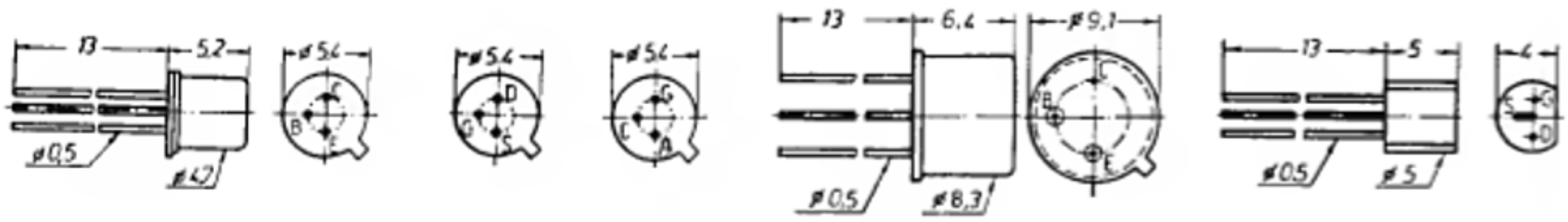
COMPLEMENTARY DARLINGTON PAIRS

TYPE NPN	TYPE PNP	P_{tot} (1) (mW)	V_{CES} min. (V)	V_{CEO} min. (V)	I_C (mA)	h_{fe} @ min.-max.	I_C (mA)	V_{CEsat} @ I_C max. (mV)	I_C (mA)	f_T typ. (MHz)	C_{ob} max. (pF)	CASE
BC 516	BC 517	625	40	30	400	30000	20	2000	350	220	4.5	TO-92a

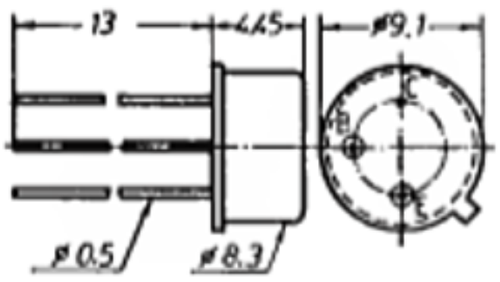
Note : (1) With the leads kept at 25°C at 2 mm from case. (2) Different h_{FE} groups: -16: 100 - 250

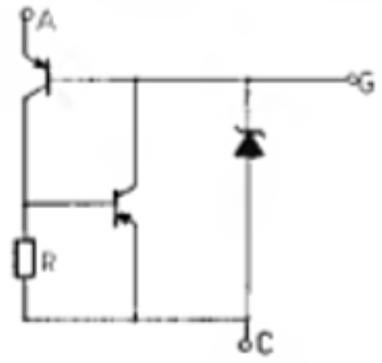
SPECIAL TYPES

BANEASA S.A.



CASES : TO-18 a / d / s TO-39 TO-92d





CASE : TO-100 2N 4983 : EQUIVALENT DIAGRAM

FAST & ULTRAFAST SWITCHING TRANSISTORS

TYPE NPN	TYPE PNP	P_{tot} @ T_A=25°C (mW)	V_{CEO} min. (V)	I_C (mA)	h_{FE} @ min.-max.	I_C (mA)	V_{CEsat} @ max. (mV)	I_C (mA)	& I_B (mA)	f_T typ. (MHz)	t_{on} max. (ns)	t_{off} t_s * max. (ns)	CASE
BSV 89		360	10	100	40-	10	300	100	10	400	12	18	TO-18a
BSV 90		360	13.5	100	40-120	10	500	100	10	400	12	18	TO-18a
BSV 91		360	15	100	40-270	10	1000	100	10	400	12	18	TO-18a
BSX 12		600	12	1 k	20-	10	700	1000	100	450	15	25	TO-100
BSX 12A		600	15	1 k	30-120	300	700	1000	100	450	15	25	TO-100
BSX 12S		600	12	1 k	22-	800	700	1000	100	450	15	25	TO-100
2N 706		360	15	200	20-	10	600	10	1	200	15	35 *	TO-18a
2N 708		360	15	200	30-120	10	400	10	1	300	40	70	TO-18a
2N 2368		360	15	200	20- 60	10	250	10	1	400	12	15	TO-18a
2N 2368S		360	6	100	30-150	20	400	20	0.66	400	20	15	TO-18a
2N 2369		360	15	200	40-120	10	250	10	1	500	12	18	TO-18a
2N 2369A		360	15	200	40-120	10	250	30	3	500	12	18	TO-18a
2N 2890		800	80	2 k	30- 90	1000	750	2000	200	30	300	1500	TO-39
2N 2891		800	80	2 k	50-150	1000	750	2000	200	30	300	1500	TO-39

FIELD-EFFECT TRANSISTORS

TYPE N-J	TYPE P-J	P_{tot} @ T_A≤ 25°C (W)	$\pm V_{DS}$ min. (V)	$-V_{GSoff}$ min.-max. (V)	I_{DSS} min.-max. (mA)	$-I_{GSS}$ max. (nA)	Y_{fs} min.-max. (ms)	f @ Y_{fs} min. (MHz)	NF @ max. (dB)	f (MHz)	C_{og} C_{is}* max. (pF)	C_{rs} max. (pF)	CASE
BF 245		0.2	30	0.5- 8	2 - 25	5	3 -6.5	500			2	1.4	TO-92d
BF 245A		0.2	30	0.5-2.2	2 -6.5	5	3 -6.5	500			2	1.4	TO-92d
BF 245B		0.2	30	1.6-3.8	6 - 15	5	3 -6.5	500			2	1.4	TO-92d
BF 245C		0.2	30	3.2-7.5	12 - 25	5	3 -6.5	500			2	1.4	TO-92d
BF 247		0.2	25	0.5-14	10 -300	5	8 -	450			15 *	5	TO-92d
BF 247A		0.2	25	1.5- 4	30 - 80	5	8 -	450			15 *	5	TO-92d
BF 247B		0.2	25	3 - 7	60 -140	5	8 -	450			15 *	5	TO-92d
BF 247C		0.2	25	5.5-12	110 -250	5	8 -	450			15 *	5	TO-92d
BF 256		0.2	30	0.5-7.5	3 - 18	5	4.5-	700	7.5	800	1.55	1	TO-92d
BF 256A		0.2	30	0.5-7.5	3 - 7	5	4.5-	700	7.5	800	1.55	1	TO-92d
BF 256B		0.2	30	0.5-7.5	6 - 13	5	4.5-	700	7.5	800	1.55	1	TO-92d
BF 256C		0.2	30	0.5-7.5	11 - 18	5	4.5-	700	7.5	800	1.55	1	TO-92d
	2N 5020	0.25	25	0.3- 5	0.3-1.2	1	0.3-		6.5	1	15		TO-18d
	2N 5021	0.25	25	0.3- 5	1 - 10	1	0.3-		6.5	1	15		TO-18d

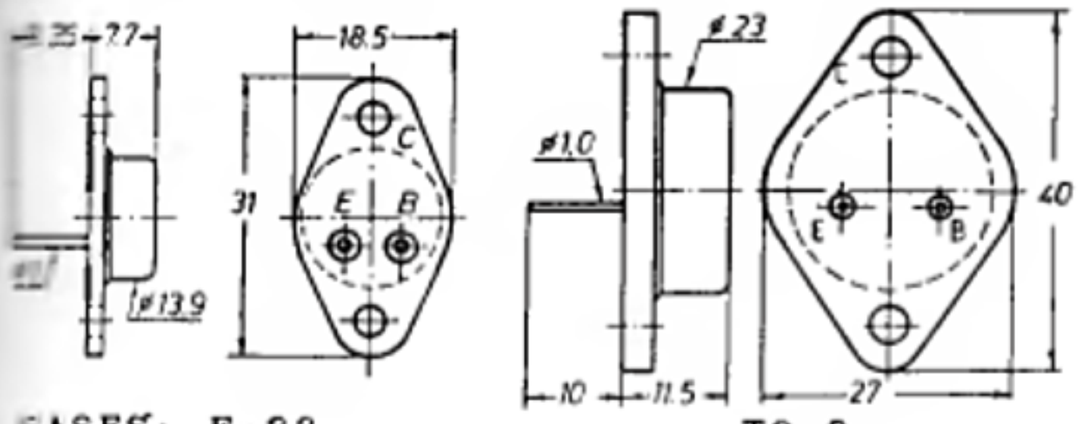
UNILATERAL SWITCH

TYPE	V_S * min. (V)	V_S * max. (V)	I_S * max. (mA)	I_H max. (mA)	I_R max. (uA)	V_F max. (V)	Th.C.# typ. (%/°C)	t_{on} max. (us)	t_{off} max. (us)	V_0 & min. (V)	C_{og} ^ typ. (pF)	CASE
2N 4983	6	10	0.5	1.5	0.1	1.5	±0.02	1	25	3.5	2.5	TO-18s

Notes : * V_S, I_S = Direct Switch Voltage, Direct Switch Current. ^ f=1MHz
Th.C. = Thermal Coefficient of V_S.
& V_0 = Maximum Pulse Voltage

BANEASA S.A.

GENERAL PURPOSE



CASES: F-22 TO-3 TO-126 (SOT-32) TO-220

TYPE NEN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C (A)	h_{FE} @ min.-max.	I_C & V_{CE} (A)	(V)	V_{CEsat} @ I_C & I_B max. (V)	(A)	(A)	f_T (MHz)	CASE
BD 135	BD136	12.5	45	45	1	33.5-300 (1)	0.15	2	0.6	0.5	0.05	50	TO-126
BD 137	BD 138	12.5	60	60	1	33.5-300 (1)	0.15	2	0.6	0.5	0.05	50	TO-126
BD 139	BD 140	12.5	80	80	1	33.5-300 (1)	0.15	2	0.6	0.5	0.05	50	TO-126
BD 142		117	50 *	45	15	12 - 60	4	4	1.1	4	0.4	0.8	TO-3
BD 181		117	55	45	15	20 - 70	3	4	1	4	0.4	0.8	TO-3
BD 182		117	70	60	15	20 - 70	4	4	1	4	0.4	0.8	TO-3
BD 183		117	85	80	15	20 - 70	3	4	1	3	0.3	0.8	TO-3
BD 233	BD 234	25	45	45	2	40 -375 (2)	0.15	2	0.6	1	0.1	3	TO-126
BD 235	BD 236	25	60	60	2	40 -375 (2)	0.15	2	0.6	1	0.1	3	TO-126
BD 237	BD 238	25	80	80	2	40 -375 (2)	0.15	2	0.6	1	0.1	3	TO-126
$ BD 239	$ BD 240	30	55	45	2	15 -	1	4	0.7	1	0.2	-	TO-220
$ BD 239A	$ BD 240A	30	70	60	2	15 -	1	4	0.7	1	0.2	-	TO-220
$ BD 239B	$ BD 240B	30	90	80	2	15 -	1	4	0.7	1	0.2	-	TO-220
$ BD 239C	$ BD 240C	30	115	100	2	15 -	1	4	0.7	1	0.2	-	TO-220
$ BD 241	$ BD 242	40	55	45	3	10 -	3	4	1.2	3	0.6	-	TO-220
$ BD 241A	$ BD 242A	40	70	60	3	10 -	3	4	1.2	3	0.6	-	TO-220
$ BD 241B	$ BD 242B	40	90	80	3	10 -	3	4	1.2	3	0.6	-	TO-220
$ BD 241C	$ BD 242C	40	115	100	3	10 -	3	4	1.2	3	0.6	-	TO-220
$ BD 243	$ BD 244	65	55	45	6	15 -	3	4	1.5	6	1	-	TO-220
$ BD 243A	$ BD 244A	65	70	60	6	15 -	3	4	1.5	6	1	-	TO-220
$ BD 243B	$ BD 244B	65	90	80	6	15 -	3	4	1.5	6	1	-	TO-220
$ BD 243C	$ BD 244C	65	115	100	6	15 -	3	4	1.5	6	1	-	TO-220
BD 433	BD 434	36	22	22	4	85 -375 (3)	0.5	1	0.5	2	0.2	3	TO-126
BD 435	BD 436	36	32	32	4	85 -375 (3)	0.5	1	0.5	2	0.2	3	TO-126
BD 437	BD 438	36	45	45	4	85 -375 (3)	0.5	1	0.6	2	0.2	3	TO-126
BD 439	BD 440	36	60	60	4	40 -375 (2)	0.5	1	0.6	2	0.2	3	TO-126
BD 441	BD 442	36	80	80	4	40 -375 (2)	0.5	1	0.8	2	0.2	3	TO-126
$ BD 533	$ BD 534	50	-	45	8	25 -	2	2	-	-	-	-	TO-220
$ BD 535	$ BD 536	50	-	60	8	25 -	2	2					TO-220
$ BD 537	$ BD 538	50	-	80	8	25 -	2	2					TO-220
$ BD 705	$ BD 706	90	-	45	12	15 -	4	4					TO-220
$ BD 707	$ BD 708	90	-	60	12	15 -	4	4					TO-220
$ BD 709	$ BD 710	90	-	80	12	15 -	4	4					TO-220
$ BD 711	$ BD 712	90	-	100	12	15 -	4	4					TO-220
$ BD 905	$ BD 906	90	-	45	15	15 -	5	4					TO-220
$ BD 907	$ BD 908	90	-	60	15	15 -	5	4					TO-220
$ BD 909	$ BD 910	90	-	80	15	15 -	5	4					TO-220
$ BD 911	$ BD 912	90	-	100	15	15 -	5	4					TO-220
BDY 29		220	100	75	30	15 - 60	15	2	1.2	15	1.5	0.8	TO-3
BDY 37		150	160	140	16	15 - 60	8	4	1.4	8	0.8	0.8	TO-3
BDY 71		29	90	55	4	80 -200	0.5	4	1	0.5	0.05	0.8	F-22
SDT 9201		117	55 *	45	15	20 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9202		117	100 *	80	15	20 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9203		117	120 *	100	15	20 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9204		117	140 *	120	15	20 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9205		117	55 *	45	15	15 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9206		117	80 *	60	15	15 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9207		117	100 *	80	15	15 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9208		117	120 *	100	15	15 - 70	4	4	1.1	4	0.4	0.8	TO-3
SDT 9209		117	140 *	120	15	15 - 70	2	4	1.1	4	0.4	0.8	TO-3
SDT 9210		117	40 *	30	15	15 -	2	2	1.1	2	0.2	0.8	TO-3
SDT 9301		87.5	40	40	10	15 -	1	4	1	1	0.1	0.8	TO-3

$ Preliminary data

Note: Different h_{FE} groups (by request, transistors pairs may be delivered):

(1): E: 33.5- 47.5 F: 42.5- 60 G: 53 - 75 H: 67 - 95 I: 85 -118 K: 196-150 L: 132-190 M: 170-236 N: 212-300 - 4: 33.5- 60 - 6: 42.5- 95 -10: 67 -150 -16: 106 -236 -25: 170 -300

(2): - 6: 40- 95 -10: 67-150 -16: 106-250 -25: 170-375

(3): -10: 85-150 -16: 106-250 -25: 170-375

GENERAL PURPOSE

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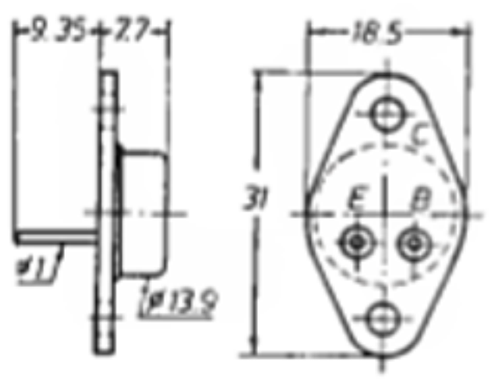
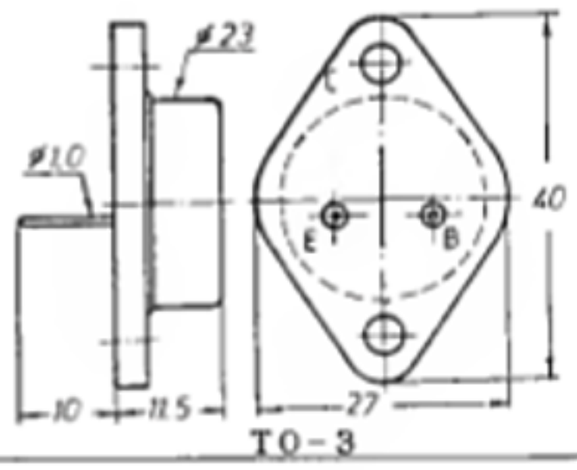
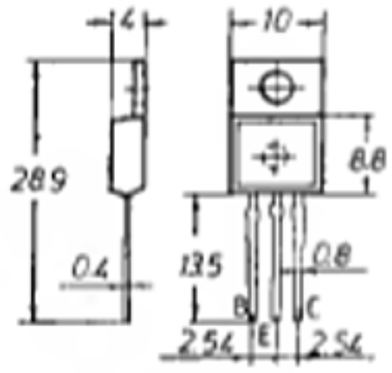


CASES : F-22



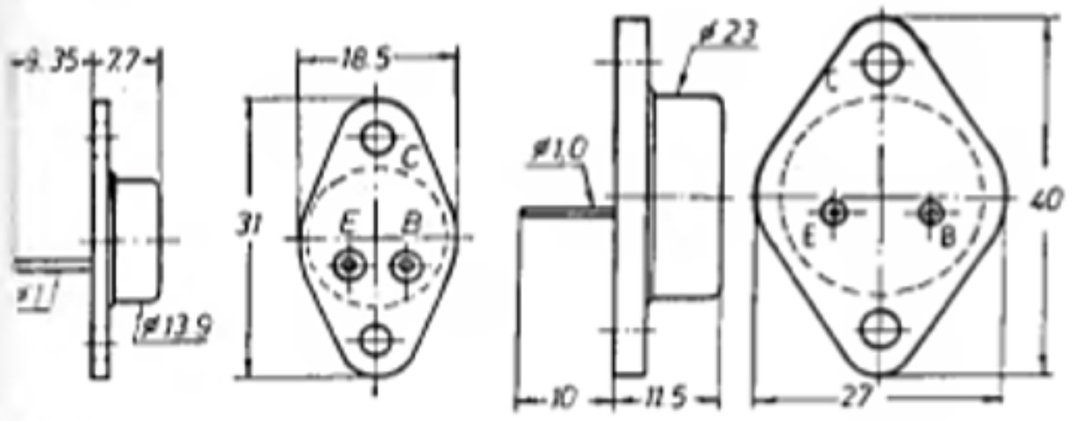
TO-3



TO-220

TYPE NPN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C (A)	h_{FE} @ min.-max.	I_C & V_{CE}		V_{CEsat} @ I_C & I_B max. (V)			f_T (MHz)	CASE
							(A)	(V)		(A)	(A)		
SDT 9302		87.5	60	60	10	15 -	1	4	1	1	0.1	0.8	TO-3
SDT 9303		87.5	80	80	10	15 -	1	4	1	1	0.1	0.8	TO-3
SDT 9304		87.5	40	40	10	15 -	2	4	1	2	0.2	0.8	TO-3
SDT 9305		87.5	60	60	10	15 -	2	4	1	2	0.2	0.8	TO-3
SDT 9306		87.5	80	80	10	15 -	2	4	1	2	0.2	0.8	TO-3
SDT 9307		87.5	40	40	10	15 -	3	4	1	3	0.3	0.8	TO-3
SDT 9308		87.5	60	60	10	15 -	3	4	1	3	0.3	0.8	TO-3
SDT 9309		87.5	80	80	10	15 -	3	4	1	3	0.3	0.8	TO-3
$ TIP 29	$ TIP 30	30	80	40	2	15 -	1	4	0.7	1	0.125		TO-220
$ TIP 29A	$ TIP 30A	30	100	60	2	15 -	1	4	0.7	1	0.125		TO-220
$ TIP 29B	$ TIP 30B	30	120	80	2	15 -	1	4	0.7	1	0.125		TO-220
$ TIP 29C	$ TIP 30C	30	140	100	2	15 -	1	4	0.7	1	0.125		TO-220
$ TIP 31	$ TIP 32	40	80	40	3	25 -	1	4	1.2	3	0.375		TO-220
$ TIP 31A	$ TIP 32A	40	100	60	3	25 -	1	4	1.2	3	0.375		TO-220
$ TIP 31B	$ TIP 32B	40	120	80	3	25 -	1	4	1.2	3	0.375		TO-220
$ TIP 31C	$ TIP 32C	40	140	100	3	25 -	1	4	1.2	3	0.375		TO-220
$ TIP 41	$ TIP 42	65	80	40	6	15 -	3	4	1.5	6	0.6		TO-220
$ TIP 41A	$ TIP 42A	65	100	60	6	15 -	3	4	1.5	6	0.6		TO-220
$ TIP 41B	$ TIP 42B	65	120	80	6	15 -	3	4	1.5	6	0.6		TO-220
$ TIP 41C	$ TIP 42C	65	140	100	6	15 -	3	4	1.5	6	0.6		TO-220
2N 1487		75	60	40	6	15 - 45	1.5	4	-	-	-	0.8	TO-3
2N 1488		75	100	55	6	15 - 45	1.5	4	-	-	-	0.8	TO-3
2N 1489		75	60	40	6	25 - 75	1.5	4	-	-	-	0.8	TO-3
2N 1490		75	100	55	6	25 - 75	1.5	4	-	-	-	0.8	TO-3
2N 3054		25	90	55	4	25 -100	0.5	4	1	0.5	0.05	0.8	F-22
2N 3055, H		117	90 *	60	15	20 - 70	4	4	1.1	4	0.4	0.8	TO-3
2N 3055W		117	70 *	60	15	15 - 70	4	4	1.5	4	0.4	0.8	TO-3
2N 3055/1		117	40 *	30	15	20 - 70	3	4	1.5	4	0.4	0.8	TO-3
2N 3055/2		117	40 *	30	15	10 - 70	3	4	1.5	4	0.4	0.8	TO-3
2N 3055/3		117	90 *	60	15	20 - 70	3	4	1.5	4	0.4	0.8	TO-3
2N 3055/4		117	30	20	15	30 - 70	3	4	1.5	4	0.4	0.8	TO-3
2N 3055/5		117	30	20	15	14 -	4	4	1.5	4	0.4	0.8	TO-3
2N 3055/6		117	90 *	60	15	15 - 70	4	4	1.1	4	0.4	0.8	TO-3
2N 3055/7		117	90 *	60	15	14 - 70	3	4	1.1	4	0.4	0.8	TO-3
2N 3055/8		117	90 *	60	15	65 -	4	4	1.5	4	0.4	0.8	TO-3
2N 3055/9		117	55 *	45	15	14 - 70	3	4	1.1	4	0.4	0.8	TO-3
2N 3055/10		117	55 *	45	15	70 -	4	4	1.1	4	0.4	0.8	TO-3
2N 3441		25	160	140	3	25 -100	0.5	4	1	0.5	0.05	0.8	F-22
2N 3442		117	160	120	10	20 - 70	8	4	5	10	2	0.8	TO-3
2N 3771		150	50	40	30	15 - 60	15	4	4	30	6	0.8	TO-3
2N 3772		150	100	60	30	15 - 60	10	4	4	20	4	0.8	TO-3
2N 3773		150	160	140	30	15 - 60	8	4	4	16	3.2	0.8	TO-3
2N 4347		100	140 *	120	10	15 - 60	2	4	2	5	0.63	0.8	TO-3
2N 4348		120	140	120	10	15 - 60	5	4	2	10	1.25	0.8	TO-3
2N 5294		36	80	70	4	30 -120	0.5	4	1	0.5	0.05	0.8	TO-220
2N 2596		36	60	40	4	30 -120	1	4	1	1	0.1	0.8	TO-220
2N 5298		36	80	60	4	20 - 80	1.5	4	1	1.5	0.15	0.8	TO-220
2N 5490		50	60	40	7	20 -100	2	4	1	2	0.2	0.8	TO-220
2N 5492		50	75	55	7	20 -100	2.5	4	1	2.5	0.25	0.8	TO-220
2N 5494		50	60	40	7	20 -100	3	4	1	3	0.3	0.8	TO-220
2N 5496		50	90	70	7	20 -100	3.5	4	1	3.5	0.35	0.8	TO-220
	2N 5871	115	60	60	15	20 -100	2.5	4	1	4	0.4	4	TO-3
	2N 5871/1	115	45	45	15	20 -	2.5	4	1	4	0.4	4	TO-3
	2N 5871/2	90	45	45	15	20 -	2.5	4	1	2	0.2	2.5	TO-3
	2N 5872	115	80	80	7	20 -100	2.5	4	1	4	0.4	4	TO-3
	2N 5872A	115	100	100	7	15 -	4	4	1.1	3	0.3	4	TO-3
	2N 5872B	115	120	120	7	10 -	4	4	1.1	3	0.3	4	TO-3
2N 5873		115	60	60	15	20 -100	2.5	4	1	4	0.4	4	TO-3
2N 5873/1		115	45	45	15	20 -	2.5	4	1	4	0.4	4	TO-3
2N 5873/2		90	45	45	15	20 -	2.5	4	1	2	0.2	2.5	TO-3

$ Preliminary data



CASES: F-22 TO-3 TO-126 (SOT-32) TO-220

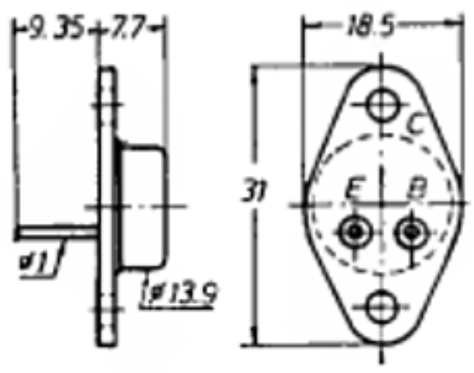
GENERAL PURPOSE TRANSISTORS (cont.)

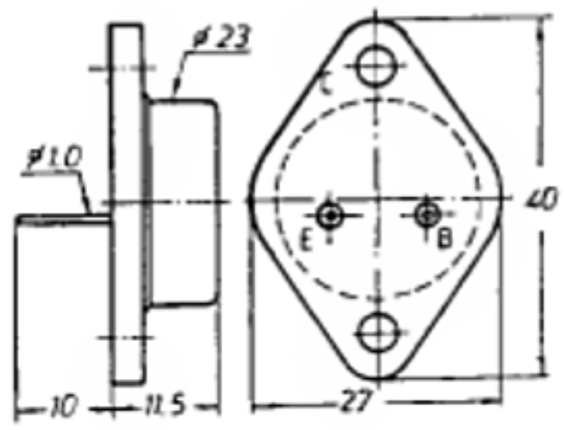
TYPE NPN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C (A)	h_{FE} @ min.-max.	I_C & V_{CE}		V_{CEsat} @ I_C & I_B max. (V)			f_T (MHz)	CASE
							(A)	(V)		(A)	(A)		
2N 5874		115	80	80	7	20 -100	2.5	4	1	4	0.4	4	TO-3
2N 5874A		115	100	100	7	15 -	4	4	1.1	3	0.3	4	TO-3
2N 5874B		115	120	120	7	10 -	4	4	1.1	3	0.3	4	TO-3
	2N 5875	150	60	60	15	20 -100	4	4	1	5	0.5	4	TO-3
	2N 5875/1	150	45	45	15	20 -	4	4	1	5	0.5	4	TO-3
	2N 5875/2	150	30	30	15	15 -	4	4	1.2	5	0.5	2.5	TO-3
	2N 5876	150	80	80	7	20 -100	4	4	1	5	0.5	4	TO-3
	2N 5876A	150	100	100	7	20 -	4	4	1.2	5	0.5	4	TO-3
	2N 5876B	150	120	120	7	20 -	4	4	1.2	5	0.5	4	TO-3
2N 5877		150	60	60	15	20 -100	4	4	1	5	0.5	4	TO-3
2N 5877/1		150	45	45	15	20 -	4	4	1	5	0.5	4	TO-3
2N 5877/2		150	30	30	15	15 -	4	4	1.2	5	0.5	2.5	TO-3
2N 5878		150	80	80	7	20 -100	4	4	1	5	0.5	4	TO-3
2N 5878A		150	100	100	7	20 -	4	4	1.2	5	0.5	4	TO-3
2N 5878B		150	120	120	7	20 -	4	4	1.2	5	0.5	4	TO-3
2N 6253		117	55 *	45	15	20 - 70	3	4	4	15	5	0.8	TO-3
2N 6254		150	100	80	15	20 - 70	5	2	4	15	3	0.8	TO-3
2N 6257		150	50	40	30	15 -	8	4	4	20	4	0.8	TO-3
2N 6258		250	100	80	30	15 - 60	10	4	4	20	4	0.8	TO-3
2N 6259		250	170	150	30	15 - 60	8	2	3	16	3.2	0.8	TO-3
2N 6260		29	50	40	3	20 -100	1.5	4	1.5	1.5	0.15	0.8	F-22
2N 6261		50	90	80	4	25 -100	1.5	2	0.2	1.5	0.15	0.8	F-22
2N 6262		150	170	150	10	20 - 70	3	2	0.5	3	0.3	0.8	TO-3
2N 6263		20	140	120	3	20 -100	0.5	4	1.2	0.5	0.05	0.8	F-22
2N 6264		50	170	150	3	20 -100	1	2	0.5	1	0.1	0.8	F-22
2N 6338A		200	120	100	25	30 -120	10	2	1.8	25	2.5	40	TO-3
2N 6339A		200	140	120	25	30 -120	10	2	1.8	25	2.5	40	TO-3
2N 6340A		200	160	140	25	30 -120	10	2	1.8	25	2.5	40	TO-3
2N 6341A		200	180	150	25	30 -120	10	2	1.8	25	2.5	40	TO-3
2N 6371		117	50	40	15	15 - 60	8	4	4	16	4	0.8	TO-3
	2N 6436A	200	100	80	25	20 - 80	10	2	1.8	25	2.5	40	TO-3
	2N 6437A	200	120	100	25	20 - 80	10	2	1.8	25	2.5	40	TO-3
	2N 6438A	200	140	120	25	20 - 80	10	2	1.8	25	2.5	40	TO-3

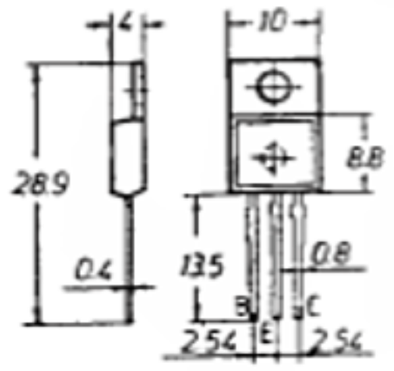
GENERAL PURPOSE DARLINGTONS

TYPE NPN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} min. (V)	V_{CEO} min. (V)	I_C (A)	h_{FE} @ min.-max.	I_C & V_{CE}		V_{CEsat} @ I_C & I_B max. (V)			f_T (MHz) hfe* -	CASE
							(A)	(V)		(A)	(mA)		
BD 643	BD 644	62.5	45	45	8	750 -	3	3	2	3	12	18 *	TO-220
BD 645	BD 646	62.5	60	60	8	750 -	3	3	2	3	12	10 *	TO-220
BD 647	BD 648	62.5	80	80	8	750 -	3	3	2	3	12	10 *	TO-220
BD 649	BD 650	62.5	100	100	8	750 -	3	3	2	3	12	10 *	TO-220
BD 651	BD 652	62.5	120	120	8	750 -	3	3	2	3	12	10 *	TO-220
BD 675	BD 676	40	45	45	4	750 -	1.5	3	2.5	1.5	6	18 *	TO-126
BD 675A	BD 676A	40	45	45	4	750 -	2	3	2.8	2	8	18 *	TO-126
BD 677	BD 678	40	60	60	4	750 -	1.5	3	2.5	1.5	6	18 *	TO-126
BD 677A	BD 678A	40	60	60	4	750 -	2	3	2.8	2	8	18 *	TO-126
BD 679	BD 680	40	80	80	4	750 -	1.5	3	2.5	1.5	6	18 *	TO-126
BD 679A	BD 680A	40	80	80	4	750 -	2	3	2.8	2	8	18 *	TO-126
BD 681	BD 682	40	100	100	4	750 -	1.5	3	2.5	1.5	6	18 *	TO-126
BD 681A	BD 682A	40	100	100	4	750 -	2	3	2.8	2	8	18 *	TO-126
$ BDX 33	$ BDX 34	70	-	45	10	750 -	4	3	-	-	-	-	TO-220
$ BDX 53	$ BDX 54	60	45	45	8	750 -	3	3	2	3	12		TO-220

$ Preliminary data







CASES : F-22 TO-3 TO-220

GENERAL PURPOSE DARLINGTONS (cont.)

TYPE NPN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} min. (V)	V_{CEO} min. (V)	I_C (A)	h_{FE} @ min.-max.	I_C & V_{CE} (A)	(V)	V_{CEsat} @ I_C & I_B max. (V)	(A)	(mA)	f_T (MHz) hfe* -	CASE
BDX 63/1	BDX 62/1	90	30	30	8	1000-	3	3	2.2	3	12	4 *	TO-3
BDX 63	BDX 62	90	60	60	8	1000-	3	3	2	3	12	4 *	TO-3
BDX 63A	BDX 62A	90	80	80	8	1000-	3	3	2	3	12	4 *	TO-3
BDX 63B	BDX 62B	90	100	100	8	1000-	3	3	2	3	12	4 *	TO-3
BDX 63C	BDX 62C	90	120	120	8	1000-	3	3	2	3	12	4 *	TO-3
BDX 65/1	BDX 64/1	117	30	30	12	1000-	5	3	2.2	5	20	4 *	TO-3
BDX 65	BDX 64	117	60	60	12	750-	5	3	2	5	20	4 *	TO-3
BDX 65A	BDX 64A	117	80	80	12	750-	5	3	2	5	20	4 *	TO-3
BDX 65B	BDX 64B	117	100	100	12	750-	5	3	2	5	20	4 *	TO-3
BDX 65C	BDX 64C	117	120	120	12	750-	5	3	2	5	20	4 *	TO-3
BDX 67	BDX 66	150	60	60	16	1000-	10	3	2	10	40	4 *	TO-3
BDX 67A	BDX 66A	150	80	80	16	1000-	10	3	2	10	40	4 *	TO-3
BDX 67B	BDX 66B	150	100	100	16	1000-	10	3	2	10	40	4 *	TO-3
BDX 67C	BDX 66C	150	120	120	16	1000-	10	3	2	10	40	4 *	TO-3
SDM 4001		117	40	40	15	500-	10	4	1.1	4	40	1	TO-3
SDM 4002		117	60	60	15	500-	10	4	1.1	4	40	1	TO-3
SDM 4003		117	80	80	15	500-	10	4	1.1	4	40	1	TO-3
SDM 4004		117	40	40	15	350-	10	4	1.5	10	100	1	TO-3
SDM 4005		117	60	60	15	350-	10	4	1.5	10	100	1	TO-3
SDM 4006		117	80	80	15	350-	10	4	1.5	10	100	1	TO-3
SDM 4010		117	100	100	10	1000-	2	4	1	2	20	1	TO-3
SDM 4011		117	120	120	10	1000-	2	4	1	2	20	1	TO-3
SDM 4012		117	140	140	10	1000-	2	4	1	2	20	1	TO-3
SDM 4013		117	160	160	10	1000-	2	4	1	2	20	1	TO-3
SDM 4014		117	100	100	10	750-	2	4	1.4	5	50	1	TO-3
SDM 4015		117	120	120	10	750-	2	4	1.4	5	50	1	TO-3
SDM 4016		117	140	140	10	750-	2	4	1.4	5	50	1	TO-3
SDM 4017		117	160	160	10	750-	2	4	1.4	5	50	1	TO-3
## TD 643	## TD 644	62.5	45	45	8	750-	3	3	2	3	12	10 *	F-22
## TD 645	## TD 646	62.5	60	60	8	750-	3	3	2	3	12	10 *	F-22
## TD 647	## TD 648	62.5	80	80	8	750-	3	3	2	3	12	10 *	F-22
## TD 649	## TD 650	62.5	100	100	8	750-	3	3	2	3	12	10 *	F-22
$ TIP 100	$ TIP 105	80	60	60	8	1000-	3	4	2	3	6	-	TO-220
$ TIP 101	$ TIP 106	80	80	80	8	1000-	3	4	2	3	6	-	TO-220
$ TIP 102	$ TIP 107	80	100	100	8	1000-	3	4	2	3	6	-	TO-220
$ TIP 110	$ TIP 115	50	60	60	4	1000-	1	4	2.5	2	8	-	TO-220
$ TIP 111	$ TIP 116	50	80	80	4	1000-	1	4	2.5	2	8	-	TO-220
$ TIP 112	$ TIP 117	50	100	100	4	1000-	1	4	2.5	2	8	-	TO-220
$ TIP 120	$ TIP 125	65	60	60	5	1000-	3	3	2	3	4	-	TO-220
$ TIP 121	$ TIP 126	65	80	80	5	1000-	3	3	2	3	4	-	TO-220
$ TIP 122	$ TIP 127	65	100	100	5	1000-	3	3	2	3	4	-	TO-220
$ TIP 130	$ TIP 135	70	60	60	8	1000-	4	4	2	4	16	-	TO-220
$ TIP 131	$ TIP 136	70	80	80	8	1000-	4	4	2	4	16	-	TO-220
$ TIP 132	$ TIP 137	70	100	100	8	1000-	4	4	2	4	16	-	TO-220
$ TIP 140T	TIP 145T	125	60	60	15	1000-	5	4	2	5	10	-	TO-220
$ TIP 141T	TIP 146T	125	80	80	15	1000-	5	4	2	5	10	-	TO-220
$ TIP 142T	TIP 147T	125	100	100	15	1000-	5	4	2	5	10	-	TO-220

Sale ! Stock liquidation.
$ Preliminary data

BDX 62 to BDX 67 series are 100% equivalent to the former TD 162,TD 163,TD 264,TD 265,TD 366,TD 367 series.

Additional characteristics : BDX 62 / BDX 63 series : t_{on} = 0.7us ; t_{off} = 2.5us ;
BDX 64 / BDX 65 series : t_{on} = 1.0us ; t_{off} = 2.5us ;
BDX 66 / BDX 67 series : t_{on} = 2.0us ; t_{off} = 6.0us.

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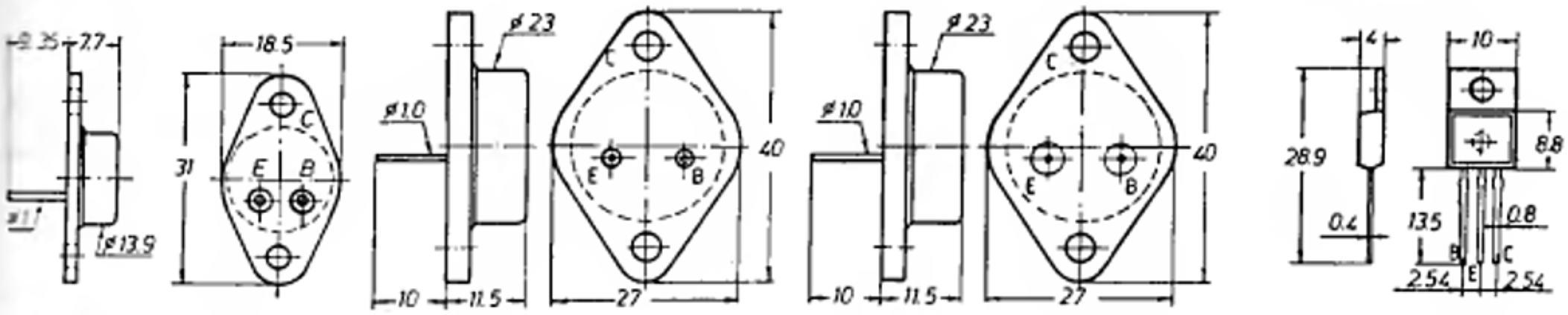

CASES: F-22 TO-3 TO-3d TO-220

TV-APPLICATION TRANSISTORS

TYPE NPN PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C I_{CM}+ (A)	V_{CEsat} V_{BEsat}^ max. (V)	@ I_C (A)	& I_B (A)	t_{on} max. (us)	t_s max. typ.! (us)	t_f t_{off}+ max. (us)	f_T (MHz)	CASE
BU 204	10 #	1300*	600	3 +	1.5 ^	2	1		10	1.5 +		TO-3d
BU 205	10 #	1500*	700	3 +	1.5 ^	2	1		10	1.5 +		TO-3d
BU 205A	10 #	1500*	700	3 +	5	2	1		10	1.5 +		TO-3d
BU 206	10 #	1700*	800	3 +	1.5 ^	2	1		10	1.5 +		TO-3d
BU 207	12.5 #	1300*	600	7.5+	5	4.5	2		10	0.7		TO-3d
BU 208	12.5 #	1500*	700	7.5+	5	4.5	2		10	0.7		TO-3d
BU 208A	12.5 #	1500*	700	7.5+	1	4.5	2		10	1.5 +		TO-3d
BU 208B	12.5 #	1500*	700	7.5+	5	4.5	2		10	0.7		TO-3d
BU 209	12.5 #	1700*	800	7.5+	5	3	1.3		10	0.7		TO-3d
BU 406	60	400	200	15 +	1	5	0.5		2.7	1.25 +		TO-220
$& BU 406D	60	400	200	15 +	1	5	0.5		2.7	1.25 +		TO-220
BU 407	60	330	200	15 +	1	5	0.5		2.7	1.25 +		TO-220
$& BU 407D	60	330	200	15 +	1	5	0.5		2.7	1.25 +		TO-220
BU 408	60	400	200	15 +	1	6	1.2		2.7	0.8 +		TO-220
$& BU 408D	60	400	200	15 +	1	6	1.2		2.7	0.8 +		TO-220
BU 504	75	1300	600	2.5	5	2	0.9		6.5	0.9		TO-220
BU 505	75	1500	700	2.5	5	2	0.9		6.5	0.9		TO-220
BU 506	75	1700	800	2.5	5	2	0.9		6.5	0.9		TO-220
BU 606	90	400	200	7	1	5	0.5		2.7	1.25 +		TO-3
& BU 606D	90	400	200	7	1	5	0.5		2.7	1.25 +		TO-3
BU 607	90	330	200	7	1	5	0.5		2.7	1.25 +		TO-3
& BU 607D	90	330	200	7	1	5	0.5		2.7	1.25 +		TO-3
BU 608	90	400	200	7	1	6	1.2		2.7	0.8 +		TO-3
& BU 608D	90	400	200	7	1	6	1.2		2.7	0.8 +		TO-3
BUR 606	60	400	200	15 +	1	5	0.5		2.7	1.25 +		F-22
& BUR 606D	60	400	200	15 +	1	5	0.5		2.7	1.25 +		F-22
BUR 607	60	330	200	15 +	1	5	0.5		2.7	1.25 +		F-22
& BUR 607D	60	330	200	15 +	1	5	0.5		2.7	1.25 +		F-22
BUR 608	60	400	200	15 +	1	6	1.2		2.7	0.8 +		F-22
& BUR 608D	60	400	200	15 +	1	6	1.2		2.7	0.8 +		F-22

$ Preliminary data
& With integrated diode
# T_C = 90 °C

TV-APPLICATION DARLINGTONS

TYPE NPN PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} min. (V)	V_{CEO} min. (V)	I_C (A)	V_{CEsat} max. (V)	@ I_C (A)	& I_B (mA)	t_{on} max. (us)	t_s max. (us)	t_f max. (us)	f_T (MHz)	CASE
$ BU 806	60	400	200	8	1.5	5	50	0.35	0.55	0.20	10	TO-220
BU 806R	60	400	200	8	1.5	5	50	0.35	0.55	0.20	10	F-22
$ BU 807	60	330	150	8	1.5	5	50	0.35	0.55	0.20	10	TO-220
BU 807R	60	330	150	8	1.5	5	50	0.35	0.55	0.20	10	F-22

$ Preliminary data

HIGH VOLTAGE DARLINGTONS

TYPE NPN PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C (A)	V_{CEsat} max. (V)	@ I_C (A)	& I_B (mA)	t_{on} max. (us)	t_s max. (us)	t_f max. (us)	f_T (MHz)	CASE
BU 930	150	400*	350	15	1.8	10	100					TO-3d
BU 931	150	450*	400	15	1.8	10	100					TO-3d
BU 932	150	500*	450	15	1.8	8	80					TO-3d

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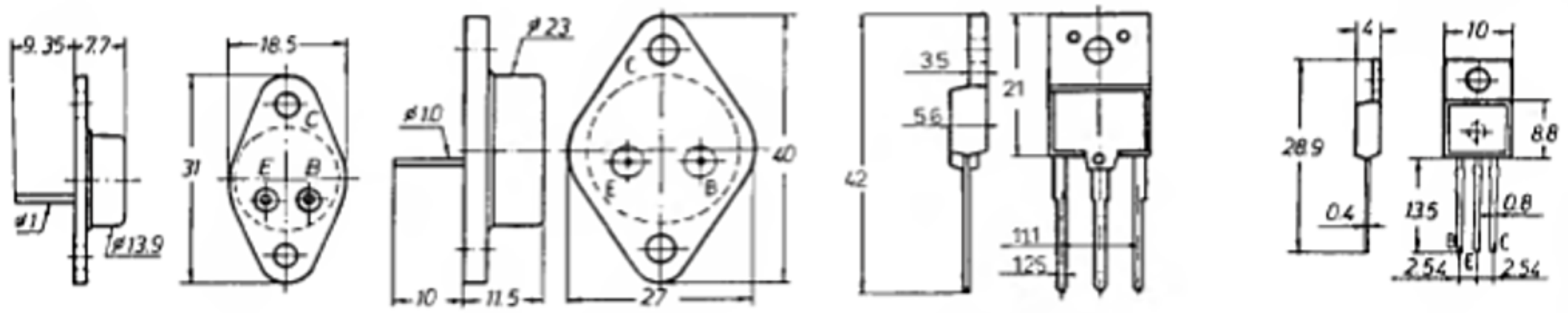

CASES: F-22 TO-3d TO-3P TO-220

HIGH VOLTAGE SWITCHING TRANSISTORS

TYPE NPN PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C I_{CM}+ (A)	V_{CEsat} max. (V)	@ I_C (A)	& I_B (A)	t_{on} max. (µs)	t_s max. (µs)	t_f max. (µs)	f_T (MHz)	CASE
## BU 84X	40	800	400	2	1	1	0.2	0.5	3.5	1.4		F-22
## BU 84/6X	40	600	375	2	1	1	0.2	0.5	3.5	1.4		F-22
## BU 84/7X	40	700	400	2	1	1	0.2	0.5	3.5	1.4		F-22
## BU 85X	40	900	450	2	1	1	0.2	0.5	3.5	0.5		F-22
BU 326A	62.5	900*	400	6	3	4	1.25	-	3.5	0.5		TO-3d
BU 326A/4	62.5	400*	300	6	3	4	1.25		3.5	0.5		TO-3d
BU 326A/5	62.5	500*	350	6	3	4	1.25		3.5	0.5		TO-3d
BU 326A/6	62.5	600*	350	6	3	4	1.25		3.5	0.5		TO-3d
BU 326A/7	62.5	700*	375	6	3	4	1.25		3.5	0.5		TO-3d
BU 326A/8	62.5	800*	400	6	3	4	1.25		3.5	0.5		TO-3d
$ BU 508	34	1500	700	8	1	4.5	2		6.5	0.7		TO-3P
BU 526	86	900*	400	8	5	8	3		3.5	0.5		TO-3d
BU 526/4	86	400*	300	8	5	8	3		3.5	1		TO-3d
BU 526/5	86	500*	350	8	5	8	3		3.5	1		TO-3d
BU 526/6	86	600*	350	8	5	8	3		3.5	1		TO-3d
BU 526/7	86	700*	375	8	5	8	3		3.5	1		TO-3d
BU 526/8	86	800*	400	8	5	8	3		3.5	1		TO-3d
$ BUF 23	37	850	450	15	1.5	10	1.33	1	4.5	0.7		TO-3P
$ BUS 11	100	850*	400	5	1.5	3	0.6	1	4	0.8		TO-3d
$ BUS 11A	100	1000*	450	10 +	1.5	2.5	0.5	1	4	0.8		TO-3d
$ BUS 11B	100	1000*	600	5	1.5	2.5	0.5	1	4	0.8		TO-3d
$ BUS 11/4	100	400*	300	5	1.5	2.5	0.5	1	4	0.8		TO-3d
$ BUS 11/6	100	600*	350	10 +	1.5	2.5	0.5	1	4	0.8		TO-3d
$ BUS 12	125	850*	400	8	1.5	6	1.2	1	4	0.8		TO-3d
$ BUS 12A	125	1000*	450	20 +	1.5	5	1	1	4	0.8		TO-3d
$ BUS 12B	125	1000*	600	8	1.5	5	1	1	4	0.8		TO-3d
$ BUS 12/4	125	400*	300	8	1.5	5	1	1	4	0.8		TO-3d
$ BUS 12/6	125	600*	350	20 +	1.5	5	1	1	4	0.8		TO-3d
$ BUS 13	150	850*	400	15	1.5	10	2	1	4	0.8		TO-3d
$ BUS 13A	150	1000*	450	30 +	1.5	8	1.6	1	4	0.8		TO-3d
$ BUS 13/5	150	500*	350	15	1.5	10	2	1	4	0.8		TO-3d
$ BUS 13/6	150	600*	375	30 +	1.5	10	2	1	4	0.8		TO-3d
$ BUS 13/7	150	700*	400	15	1.5	10	2	1	4	0.8		TO-3d
$ BUS 14	214	850*	400	30	1.7	20	4	1	4	0.8		TO-3d
$ BUS 14A	214	1000*	450	50 +	1.7	16	3.2	1	4	0.8		TO-3d
$ BUS 14/4	214	400*	300	30	1.5	20	4	1	4	0.8		TO-3d
$ BUS 14/5	214	500*	350	50 +	1.5	20	4	1	4	0.8		TO-3d
$ BUS 14/6	214	600*	375	30	1.5	20	4	1	4	0.8		TO-3d
$ BUS 14/7	214	700*	400	50 +	1.5	20	4	1	4	0.8		TO-3d
$ BUT 11	100	850*	400	5	1.5	3	0.6	1	4	0.8		TO-3d
$ BUT 11A	100	1000*	450	10 +	1.5	2.5	0.5	1	4	0.8		TO-3d
$ BUT 11/5	100	500*	350	5	1.5	3	0.6	1	4	0.8		TO-3d
$ BUT 11/6	100	600*	375	10 +	1.5	3	0.6	1	4	0.8		TO-3d
$ BUT 11/7	100	700*	400	5	1.5	3	0.6	1	4	0.8		TO-3d
$ BUT 12	125	850	400	8	1.5	5	1	1	4	0.8		TO-220
$ BUT 12A	125	1000	450	8	1.5	5	1	1	4	0.8		TO-220
$ BUT 18	110	850	400	6	1.5	6	1.2	1	4	0.8		TO-220
$ BUT 18A	110	1000	450	6	1.5	6	1.2	1	4	0.8		TO-220
$ BU 426	113	900	400	6	1.5	2.5	0.5	0.6	3.5	0.15		TO-3P
BU 508 AF	125	1500	700	8	1.0	4.5	2		7	0.55		TO-3P
$ BUW 25	125	600*	400	10	1.5	4	1	0.5	2	0.5		TO-3d
$ BUW 25/5	125	500*	400	10	1.5	4	1	0.5	2	0.5		TO-3d
$ BUW 26	125	800*	450	10	1.5	4	1	0.5	2	0.5		TO-3d
BUX 10A	150	160	125	25	1.2	20	2	1.5	1.2	0.3		TO-3
BUX 11A	150	250	200	20	1.5	12	1.5	1	1.8	0.4		TO-3

Sale ! Stock liquidation.

$ Preliminary data

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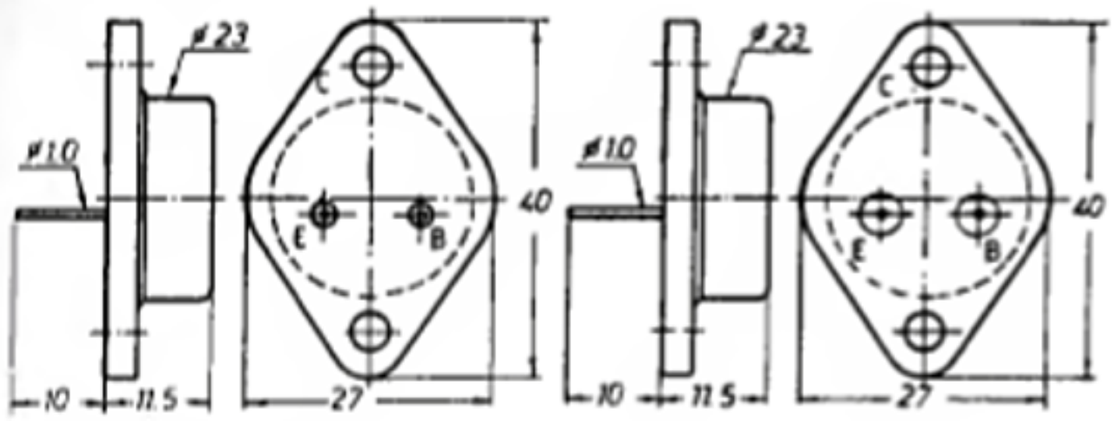

CASES: TO-3 TO-3d TO-126 (SOT-32) TO-220

HIGH VOLTAGE SWITCHING TRANSISTORS (cont.)

TYPE NPN	TYPE PNP	P_{tot} @ T_C=25°C (W)	V_{CBO} V_{CEX}* min. (V)	V_{CEO} min. (V)	I_C I_{CM}+ (A)	V_{CEsat} max. (V)	@ I_C (A)	& I_B (A)	t_{on} max. (us)	t_s max. (us)	t_f max. (us)	f_T (MHz)	CASE
BUX 12A		150	300	250	20	1.5	10	1.25	1	2	0.5	8	TO-3
BUX 40A		120	160	125	20	1.6	15	1.88	1.2	1	0.4	8	TO-3
BUX 41A		120	250	200	15	1.6	8	1	1	1.7	0.8	8	TO-3
BUX 42A		120	300	250	12	1.6	6	0.75	1	2	1.2	8	TO-3
BUX 80		100	800*	400	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 80/4		100	400*	300	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 80/5		100	500*	350	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 80/6		100	600*	375	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 80/7		100	700*	400	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 81		100	1000*	450	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 81/9		100	900*	400	10	3	8	2.5	0.5	3.5	0.5	-	TO-3d
BUX 82		60	800*	400	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 82/4		60	400*	300	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 82/5		60	500*	350	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 82/6		60	600*	375	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 82/7		60	700*	400	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 83		60	1000*	450	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
BUX 83/9		60	900*	400	6	3	4	1.25	0.5	3.5	0.5	4	TO-3d
$ BUX 84		40	800	400	2	1	1	0.2	0.5	3.5	1.4	-	TO-220
$ BUX 84/4		40	400	300	2	1	1	0.2	0.5	3.5	1.4	-	TO-220
$ BUX 84/5		40	500	350	2	1	1	0.2	0.5	3.5	1.4	-	TO-220
$ BUX 84/6		40	600	375	2	1	1	0.2	0.5	3.5	1.4	-	TO-220
$ BUX 84/7		40	700	400	2	1	1	0.2	0.5	3.5	1.4	-	TO-220
$ BUX 85		40	900	450	2	1	1	0.2	0.5	3.5	0.5	-	TO-220
$ BUX 86		20	800	400	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 86/4		20	400	300	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 86/5		20	500	350	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 86/6		20	600	375	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 86/7		20	700	400	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 87		20	1000	450	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ BUX 87/9		20	900	400	1 +	1.5	0.1	0.1	0.5	3.5	0.5	-	TO-126
$ MJE 13004		75	600	300	4	1	4	1	0.8	4	0.9	-	TO-220
$ MJE 13005		75	700	400	4	1	4	1	0.8	4	0.9	-	TO-220
$ MJE 13006		80	600	300	8	3	8	2	0.7	3	0.7	-	TO-220
$ MJE 13007		80	700	400	8	3	8	2	0.7	3	0.7	-	TO-220
$ MJE 13008		100	600	300	12	3	12	3	1	3	0.8	-	TO-220
$ MJE 13009		100	700	400	12	3	12	3	1	3	0.8	-	TO-220
	2N 6653	150	350	300	20	0.6	15	3	0.25	1.5	0.35	25	TO-3
	2N 6653A	188	350	300	16	0.8	12	2.4	0.25	1.8	0.5	25	TO-3
	2N 6653B	188	350	300	12	0.8	8	1.6	0.4	2.5	0.5	25	TO-3
	2N 6653/1	150	350	300	20	0.8	15	3	0.25	1.5	0.35	25	TO-3
	2N 6653/2	150	350	300	15	0.8	10	2	0.25	1.5	0.35	25	TO-3
	2N 6653/3	125	350	300	10	0.8	7	1.4	0.25	2.5	0.5	25	TO-3
	2N 6653/4	125	350	300	7	0.8	5	1	0.4	2.5	0.5	25	TO-3
	2N 6654	150	400	350	20	0.6	15	3	0.25	1.5	0.35	25	TO-3
	2N 6654A	188	400	350	16	0.8	12	2.4	0.25	1.8	0.5	25	TO-3
	2N 6654B	188	400	350	12	0.8	8	1.6	0.4	2.5	0.5	25	TO-3
	2N 6654/1	150	400	350	20	0.8	15	3	0.25	1.5	0.35	25	TO-3
	2N 6654/2	150	400	350	15	0.8	10	2	0.25	1.5	0.35	25	TO-3
	2N 6654/3	125	400	350	10	0.8	7	1.4	0.4	2.5	0.5	25	TO-3
	2N 6654/4	125	400	350	7	0.8	5	1	0.4	2.5	0.5	25	TO-3
	2N 6655	150	450	400	20	0.6	15	3	0.25	1.5	0.35	25	TO-3
	2N 6655A	188	450	400	16	0.8	12	2.4	0.25	1.8	0.5	25	TO-3
	2N 6655B	188	450	400	12	0.8	8	1.6	0.4	2.5	0.5	25	TO-3
	2N 6655/1	150	450	400	20	0.8	15	3	0.25	1.5	0.35	25	TO-3
	2N 6655/2	150	450	400	15	0.8	10	2	0.25	1.5	0.35	25	TO-3
	2N 6655/3	125	450	400	10	0.8	7	1.4	0.4	2.5	0.5	25	TO-3
	2N 6655/4	125	450	400	7	0.8	5	1	0.4	2.5	0.5	25	TO-3

$ Preliminary data

C A P A C I T O R S

Electrolytic Capacitors _____ page 87

Paper Capacitors _____ page 97

Metallised polypropylene film capacitors for A.C. use _____ page 105

QUICK REFERENCE GUIDE

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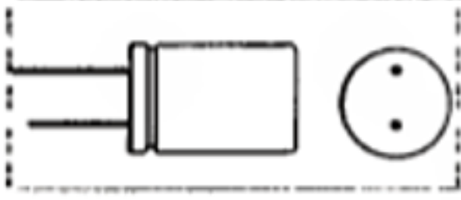
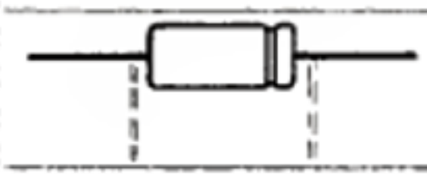
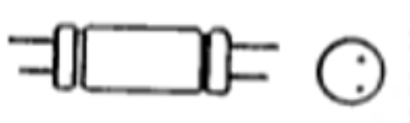
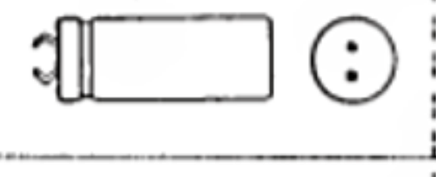
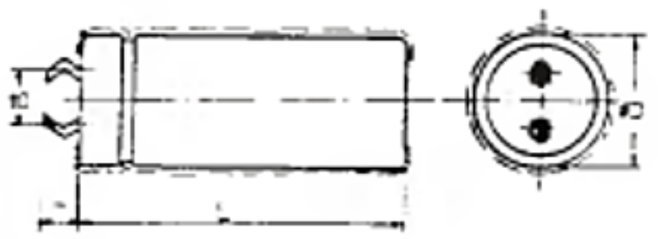
Configuration	Type	Voltage range	Capacitance range	Capacit. tolerance	Load life	Size (mm) min.	Size (mm) max.	Page
	EG 6400 Radial miniature	6.3V$_{dc}$ to 100V$_{dc}$	0.22 uF to 15,000 uF	± 20%	1000 h. + 85°C	5x11	16x32	88
	EG 6100 General purpose	6.3V$_{dc}$ to 63V$_{dc}$	4.7 uF to 1,500 uF	-10/ +50% -10/+100% ± 20 %	1000 h. + 70°C	9.5x12.7	18x32	90
	EG 7300 General purpose	25 V$_{dc}$ to 40 V$_{dc}$	680 uF to 2,200 uF	-10/+50% (±20% by request)	1000 h. + 70°C	30x31	30x35	90
	EG 5200 General purpose	6.3V$_{dc}$ to 350V$_{dc}$	2.2 uF to 1,500 uF	-10/+ 50% -10/+100% ± 20%	1000 h. + 70°C	6.5x17	14x42.5	91
	EG 7400 General purpose	16 V$_{dc}$ to 450V$_{dc}$	10 uF to 10,000 uF	-10/+50% (±20% by request)	1000 h. + 70°C	20x38	30x65	92
	EG 1100 Single / / multiple	350V$_{dc}$ to 450V$_{dc}$	22 uF to 100 uF 15+15 uF to 47+47 uF	-10/+50% (±20% by request)	1000 h. + 70°C	29x46	35x73	93
	EG 2400 Single / / multiple	160V$_{dc}$ to 350V$_{dc}$	100 to 220uF 47+47 to 330+220 uF 47+47+100 to 100+100+10uF	-10/+50% (±20% by request)	1000 h. + 70°C	30x60	35x80	93
	EG 7600 High capacitance	16 V$_{dc}$ to 350V$_{dc}$	680 uF to 47,000 uF	-10/+50% (±20% by request)	1000 h. + 70°C	35x70	50x115	94
	EP 7700 High capacitance	10 V$_{dc}$ to 350V$_{dc}$	220 uF to 33,000 uF	-10/+50% (±20% by request)	1000 h. + 70°C	35x75	35x118	94
	EF 7738 High capacitance	7.5V$_{dc}$	33,000 uF	-10/+50% (±20% by request)	1000 h. + 70°C		35x117	94
	EF 7217IT High voltage	200V$_{dc}$	120 uF	-10/+50% (±20% by request)	1000 h. + 70°C		26x94	95
	EP 7738IT High voltage	200V$_{dc}$	680 uF to 820 uF	-10/+50% (±20% by request)	1000 h. + 70°C		35x118	95
	EM 4800 AC Motor start	220V$_{ac}$/ /250V$_{dc}$	80 uF to 100 uF	-10/+50% (0/+30% by request)	1000 h. + 70°C	35x75	35x88	96
	ES 2400 Snap leads High voltage	160V$_{dc}$ to 350V$_{dc}$	100 uF to 330 uF	-10/+50% 0-30%	1000 h. + 70$_{o}$C	25x41		87
	ES 7500 Snap leads High capacitance	25V$_{dc}$ to 63V$_{dc}$	2200 uF to 6800 uF	-10/+50% 0-30%	1000 h. + 70$_{o}$C	25x34	25x41	87

ES 2400 SERIES

SNAP LEADS HIGH VOLTAGE ELECTROLYTIC CAPACITORS

ES 2400 Series are used for Radio-TV electric circuits and computer technic.

TYPE	D(mm)	L(mm)
ES 2425	25	41



Dimensions (D x L)

(Size: mm)

\ Vdc / uF \	160	250	350
100	25 x 41		25 x 41
150			25 x 41
220			25 x 41
330		25 x 41	

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	Vdc 160 250 350
Tangent of Loss Angle (Max.)	Tan.d 0.15 0.15 0.15
Capacitance Tolerance	-10% ... + 50% ; 0% ...+30%
Leackage Current	I </= 0.006 CV + 4 uA
Basic specifications	IEC 384-4

ES 7500 SERIES

SNAP LEADS ELECTROLYTIC CAPACITORS

ES 7500 Series are used for Radio-TV electric circuits and computer technic.

TYPE	D(mm)	L(mm)
ES 7525	25	34
ES 7525	25	41

Dimensions (D x L)

(Size: mm)

\ Vdc / uF \	25	40	63
2200			25 x 41
4700	25 x 34	25 x 41	
6800	25 x 41		

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	Vdc 25 40 63
Tangent of Loss Angle (Max.)	Tan.d 0.40 0.32 0.22
Capacitance Tolerance	-10% ... + 50% ; 0% ...+30%
Leackage Current	I </= 0.006 CV + 4 uA
Basic specifications	IEC 384-4

RADIAL MINIATURE

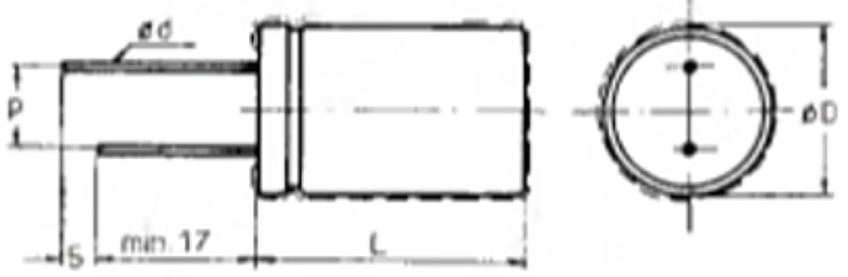
BANEASA S.A.

EG 6400 SERIES

RADIAL LEADS MINIATURE ELECTROLYTIC CAPACITORS

EG 6400 Series are used broadly not only for Audio, Radio and TV electric circuits but also for industrial equipments and applications. They represent our standard capacitors , which characteristics as dissipation factor, leakage current and other performances are subject of continuous enhancement.

TYPE	D(mm)	P(mm)	d(mm)
EG 6405	5	2.0	0.5
EG 6406	6	2.5	0.6
EG 6408	8	3.5	0.6
EG 6410	10	5.0	0.6
EG 6413	13	5.0	0.6
EG 6416	16	7.5	0.8



Minus lead marked on PVC sleeve.

Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	6.3	10	16	25	35	50	63	100
0.22						5 x 11	5 x 11	5 x 11
0.33						5 x 11	5 x 11	5 x 11
0.47						5 x 11	5 x 11	5 x 11
0.68						5 x 11	5 x 11	5 x 11
1.0						5 x 11	5 x 11	5 x 11
1.5						5 x 11	5 x 11	5 x 11
2.2						5 x 11	5 x 11	5 x 11
3.3				5 x 11	5 x 11	5 x 11	5 x 11	5 x 11
4.7				5 x 11	5 x 11	5 x 11	5 x 11	5 x 11
6.8				5 x 11	5 x 11	5 x 11	5 x 11	6 x 11
10			5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11
15			5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	8 x 11
22		5 x 11	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11
33		5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11	10 x 13
47	5 x 11	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11	8 x 11	10 x 16
68	5 x 11	5 x 11	5 x 11	6 x 11	8 x 11	8 x 11	10 x 13	10 x 16
100	5 x 11	5 x 11	6 x 11	8 x 11	8 x 11	10 x 13	10 x 16	10 x 16
150	6 x 11	6 x 11	6 x 11	8 x 11	10 x 13	10 x 13	10 x 16	13 x 25
220	6 x 11	6 x 11	8 x 11	10 x 13	10 x 16	10 x 16	10 x 16	13 x 30
330	6 x 11	8 x 11	8 x 11	10 x 13	10 x 16	13 x 16	10 x 16	
470	8 x 11	8 x 11	10 x 13	10 x 16	13 x 16	13 x 16	13 x 25	
680	8 x 11	10 x 13	10 x 16	13 x 16	13 x 16	13 x 21	13 x 30	
1000	10 x 13	10 x 16	10 x 16	13 x 21	13 x 25	13 x 30		
1500		10 x 16	13 x 16	13 x 21	13 x 25	16 x 32		
2200		13 x 16	13 x 21	13 x 25	16 x 32			
3300		13 x 21	13 x 25	16 x 32				
4700		13 x 30	16 x 32	16 x 32				
6800		13 x 30	16 x 32	16 x 32				
10000		16 x 32	16 x 32					
15000		16 x 32						

THE HIGH VOLTAGE SERIES (Advanced Information)

Dimensions (D x L)

(Size : mm)

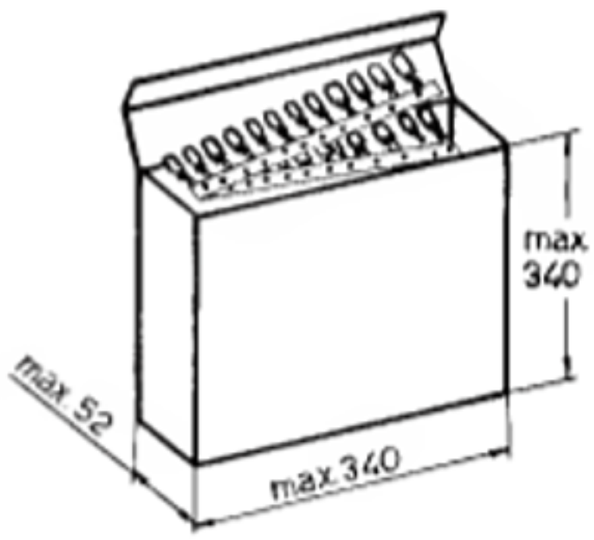
\ Vdc / uF \	160	250
$ 1	6 x 11	6 x 11
$ 10	10 x 16	10 x 21
$ 22	13 x 25	13 x 25
$ 47	16 x 25	16 x 25
$ 100	16 x 32	16 x 32

$ Preliminary data

EG 6400 SERIES (Cont.)

Specifications

Item	Characteristics
Operating Temperature Range	-40°C ... +85°C
Rated Voltage Range	6.3Vdc ... 100Vdc
Capacitance Tolerance	+/-20% (-10% ... +30% on request)
Leakage Current	I = 0.03 Cn x Vn or 5 uA at 20°C and Vn (after 3 min.)
Tangent of Loss Angle (Max.)	Vdc 6.3 10 16 25 35 50 63 100 Tan.d 0.35 0.35 0.25 0.25 0.20 0.15 0.12 0.10 T = 20 °C ; f = 100 Hz However, add 0.02 to the value in the table for each additional 1,000uF regarding to those of which nominal capacitance exceeds 1,000uF
High Temperature Load Test	After applying DC voltage equal to the rated voltage at 85°C for 1000 ± 12 hours, the capacitor is led to have the nominal temperature, the measured value satisfies the following conditions: (1) Leakage current : less than specified value before test. (2) Capacitance change : within ± 20% of the initial value. (3) Tan.d : less than 200% of specified value before test.
High Temperature No-Load Test	After leaving the capacitor heated at 85°C for 1,000 ± 12 hours without applying voltage, it is led to have the nominal temperature, when measured value satisfies the following conditions: (1) Leakage current : less than specified value before test. (2) Capacitance change : within ± 20% of the initial value. (3) Tan.d : less than 200% of specified value before test.
Other specifications	JIS C-5141 W-characteristics , IEC 384-4 G.P. grade



Taping specifications

Symbol	Specification		
	Value		Tolerance
ØD	5 / 6	8	
L	11.5	11.5..12	
Ød	0.5	0.6	+/- 0.05
P	12.7	12.7	+/- 1.0
P1	12.7	12.7	+/- 0.3
P2	6.35	6.35	+/- 1.0
f	5.0	5.0	+0.8/-0.2
Wp	18.0	18.0	+/- 0.5
Wr	15.0	15.0	+/- 0.8
W1	9.0	9.0	+/- 0.5
W2	3.0	3.0	max.
H1	18.5	20.0	+1.5/-0.5
H	16.0	16.0	+/- 0.5
P3	3.85	3.85	+/- 0.5
ØD1	4.0	4.0	+/- 0.2
△h1	0.0	0.0	+/- 2.0
t	0.4	0.4	+/- 0.15
T	0.7	0.7	+/- 0.2
△h2	0.0	0.0	+/- 1.3

ELECTROLYTIC CAPACITORS

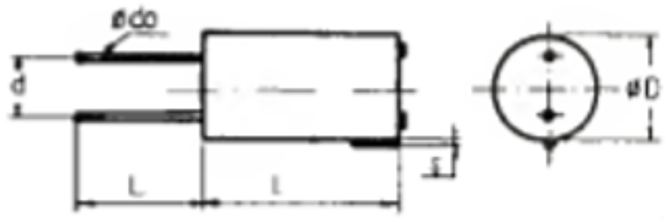
GENERAL PURPOSE

BANEASA S.A.

EG 6100 SERIES

SALE !
STOCK LIQUIDATION

TYPE	D	d	do	l	s
EG 6111	9.5	5.0	0.8	16	0.5
EG 6121	12.7	5.0	0.8	16	0.5
EG 6123	12.7	5.0	0.8	16	0.5
EG 6142	18	10	0.8	16	0.5
EG 6144	18	10	0.8	16	0.5



Dimensions (D x L)

(Size : mm)

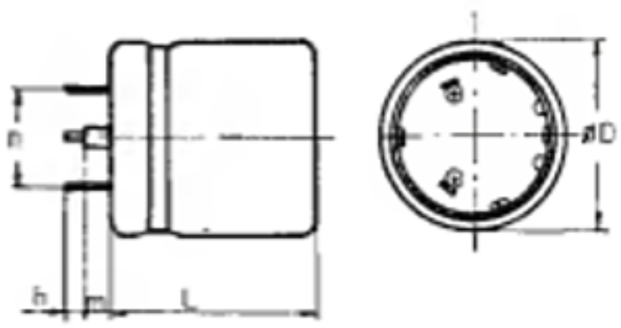
\ Vdc / uF \	6.3	10	16	25	40	63
4.7					9.5 x 12.7	9.5 x 12.7
6.8					9.5 x 12.7	9.5 x 12.7
10					9.5 x 12.7	
15					9.5 x 12.7	
22				9.5 x 12.7		12.7 x 12.7
33				9.5 x 12.7		12.7 x 12.7
47		9.5 x 12.7	9.5 x 12.7	12.7 x 12.7		12.7 x 25.4
68	9.5 x 12.7	9.5 x 12.7	9.5 x 12.7	12.7 x 12.7		12.7 x 25.4
100	9.5 x 12.7	12.7 x 12.7	12.7 x 12.7	12.7 x 25.4	12.7 x 25.4	
150	12.7 x 12.7	12.7 x 12.7	12.7 x 12.7	12.7 x 25.4		
220	12.7 x 12.7	12.7 x 25.4	12.7 x 25.4	12.7 x 25.4		
330	12.7 x 25.4	12.7 x 25.4	12.7 x 25.4			
470	12.7 x 25.4		18 x 18	18 x 32		
680		18 x 32	18 x 32	18 x 32		
1000		18 x 32	18 x 32			
1500		18 x 32				

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	6.3Vdc ... 63Vdc
Capacitance Tolerance	-10% ... +100% ; -10% ...+50% ; +/-20%
Leackage Current	for CV > 1000 uFxV I </= 0.03 CV + 20 uA for CV </= 1000 uFxV I </= 0.05 CV , but min. 5uA
Tangent of Loss Angle (Max.)	Vdc 6.3 10 16 25 40 63 Tan.d 0.50 0.50 0.35 0.35 0.25 0.25
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level. Test conditions: (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100 Hz.
Basic specifications	IEC 384-4 G.P. grade

EG 7300 SERIES

TYPE	D	L	h	m	n
EG 7330	30	31	4.3	5	10.2
EG 7335	30	35	4.3	5	10.2



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	25	40
680	30 x 31	30 x 31
1000	30 x 31	30 x 35
1500	30 x 31	30 x 35
2200	30 x 31	30 x 35

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C...+70°C
Rated Voltage Range	25Vdc ... 40Vdc
Capacitance Tolerance	-10% ... +50% ; +/- 20%
Leackage Current	I </= 0.03 CV + 20 uA
Tangent of Loss Angle (Max.)	Vdc 25 40 Tan.d 0.35 0.25
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level. Test conditions: (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100Hz.
Basic specifications	IEC 384 4 G.P. grade

BANEASA S.A.

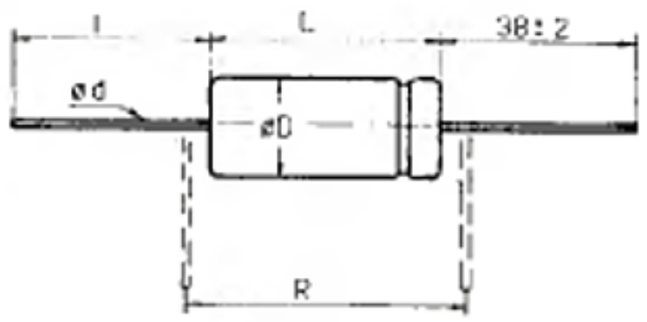
EG 5200 SERIES

SALE !
STOCK LIQUIDATION

AXIAL LEADS ELECTROLYTIC CAPACITORS

EG 5200 Series are used both for consumer electronics and for industrial equipments.

TYPE	D	L	l	R	do
EG 5243	6.5	17	38	22	0.8
EG 5244	6.5	20	38	25	0.8
EG 5245	6.5	23	38	28	0.8
EG 5247	8	17	38	22	0.8
EG 5248	8	20	38	25	0.8
EG 5249	8	23	38	28	0.8
EG 5250	8	26	38	31	0.8
EG 5251	9.5	20	38	25	0.8
EG 5252	9.5	23	38	28	0.8
EG 5253	9.5	26	50	31	0.8
EG 5256	12	23	50	28	0.8
EG 5257	12	26	50	31	0.8
EG 5258	12	32	50	37	0.8
EG 5259	12	39	60	44	0.8
EG 5260	14	26	50	31	0.8
EG 5261	14	32	60	37	0.8
EG 5262	14	39	60	44	0.8
EG 5263	14	42.5	60	47.5	0.8



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	6.3	10	16	25	40	63	100	160	250	350
2.2						6.5x17	8x17			
3.3						6.5x17	8x17			
4.7					6.5x17	8x17	8x23			
6.8					6.5x17	8x17	8x23	12x23	12x26	12x32
10				6.5x20	8x17	8x23	9.5x23	12x26	12x32	14x32
15				6.5x20	8x17	8x23	9.5x23	12x32	12x39	14x42.5
22		6.5x17	8x17	8x20	8x23	9.5x23	12x26	12x32	14x39	
33		6.5x17	8x17	8x20	8x23	9.5x23	12x26	14x42.5		
47	6.5x23	9.5x20	8x23	8x26	9.5x26	12x26	14x32			
68	6.5x23	9.5x20	8x23	8x26	9.5x26	12x26	14x32			
100	8x23	9.5x20	9.5x23	9.5x26	12x26	14x32	14x42.5			
150	8x23	9.5x23	9.5x23	9.5x26	12x26	14x39				
220	9.5x23	9.5x26	12x26	12x32	14x32	14x42.5				
330	9.5x23	12x26	12x26	12x32	14x42.5					
470	12x26	12x32	14x26	14x39						
680	12x26	12x32	14x32	14x42.5						
1000	14x32	14x39	14x42.5							
1500	14x32	14x39								

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	$-25^{o}C$ ... $+70^{o}C$
Rated Voltage Range	6.3Vdc ... 350Vdc
Capacitance Tolerance	-10% ... +100% ; -10% ... +50% ; +/-20%
Leackage Current	for CV > 1000 uFxV I </= 0.03 CV + 20 uA for CV </= 1000 uFxV I </= 0.05 CV , but min. 5uA
Tangent of Loss Angle (Max.)	Vdc 6.3 10 16 25 40 63 100 160 250 350 Tan.d 0.5 0.5 0.35 0.35 0.25 0.25 0.2 0.2 0.2 0.2
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level in the following test conditions: (1) Temperature = $40^{o}C$; (2) Rated voltage with maximum permissible ripple current at 100 Hz.
Basic specifications	IEC 384-4 G.P. grade

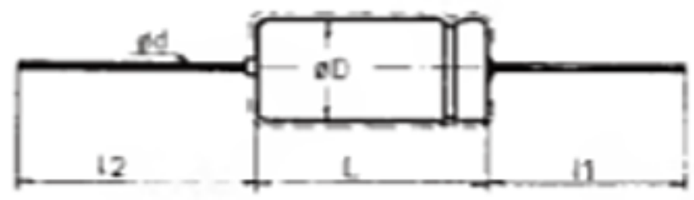
BANEASA S.A.

EG 7400 SERIES

AXIAL LEADS ELECTROLYTIC CAPACITORS

EG 7400 Series are high capacitance axial leads electrolytic capacitors, beeing used broadly not only for audio, TV, stereo and other electric circuits but also for industrial equipment.

TYPE	D	L	l1	l2	do
EG 7473	20	38	38	60	0.8
EG 7474	20	50	38	60	0.8
EG 7475	25	38	38	60	0.8
EG 7476	20	65	38	60	0.8
EG 7477	25	50	38	60	0.8
EG 7478	30	50	38	60	0.8
EG 7479	25	65	38	60	0.8
EG 7480	30	65	38	60	0.8



Dimensions (D x L)

(Size : mm)

uF \ Vdc	16	25	40	63	100	160	250	350	450
10									20 x 38
15								20 x 38	20 x 50
22							20 x 38	20 x 50	20 x 65
33						20 x 38	20 x 50	20 x 65	25 x 65
47						20 x 50	20 x 65	35 x 50	30 x 50
68						20 x 65	25 x 50	30 x 50	30 x 65
100					20 x 38	25 x 65	30 x 50	30 x 65	
150					20 x 50	30 x 50	30 x 65		
220				20 x 38	20 x 65	30 x 65			
330				20 x 50	30 x 50				
470			20 x 38	25 x 38	30 x 65				
680		20 x 38	20 x 50	30 x 50	30 x 65				
1000		20 x 50	20 x 65	30 x 50	30 x 65				
1500		20 x 65	30 x 50	30 x 65					
2200	25 x 38	25 x 50	30 x 65	30 x 65					
3300	25 x 50	30 x 65	30 x 65						
4700	30 x 50	30 x 65							
6800	30 x 65	30 x 65							
10000	30 x 65								

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	16Vdc ... 450Vdc
Capacitance Tolerance	-10% ... +50% ; +/-20%
Leackage Current	I </= 0.03 CV + 20 uA
Tangent of Loss Angle (Max.)	Vdc 16 25 40 63 100 160 250 350 450 Tan.d 0.35 0.35 0.35 0.35 0.20 0.20 0.20 0.20 0.20
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level in the following test conditions : (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100 Hz.
Basic specifications	IEC 384-4 G.P. grade

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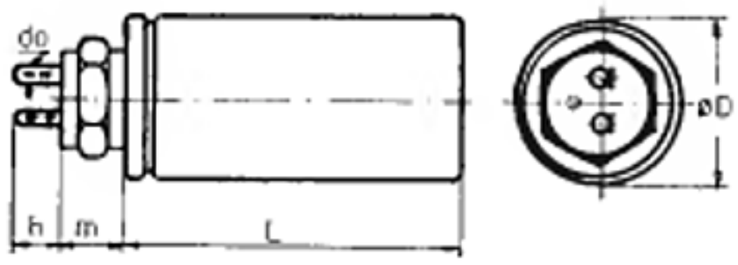
EG 1100 SERIES

EG 1100 Series are mainly used in TV sets power supplies, but also for consumer and industrial electronics.

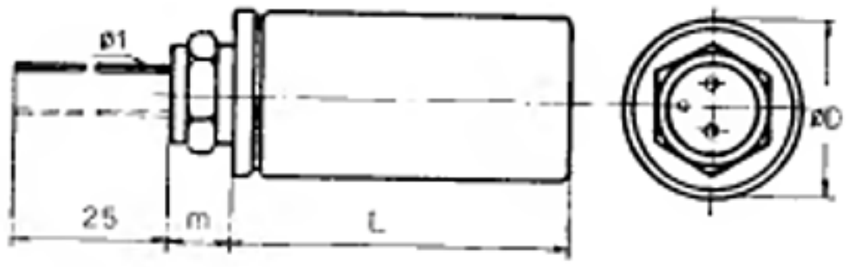
TYPE	D	L	h	do	m
EG 1162	29	46	8	3	11
EG 1163	29	63	8	3	11
EG 1164	29	73	8	3	11
EG 1170	35	73	8	3	11



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	350	450
22		30 x 46
33	30 x 46	30 x 46
47	30 x 46	30 x 63
100	30 x 73	35 x 73
15 + 15	30 x 46	30 x 46
33 + 33	30 x 63	35 x 73
47 + 47	30 x 73	35 x 73



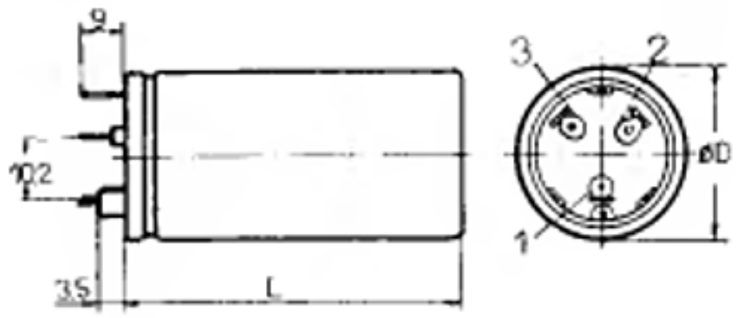
Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	350Vdc ... 450Vdc
Capacitance Tolerance	-10% ... +50% ; +/-20%
Leackage Current	I </= 0.03 CV + 20 uA
Tangent of Loss Angle (Max.)	Vdc 350 450 Tan.d 0.20 0.20
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level in the following test conditions : (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100Hz.
Basic specifications	IEC 384-4 G.P. grade

EG 2400 SERIES

EG 2400 Series are mainly used for TV sets power supplies, but also for consumer and industrial electronics.

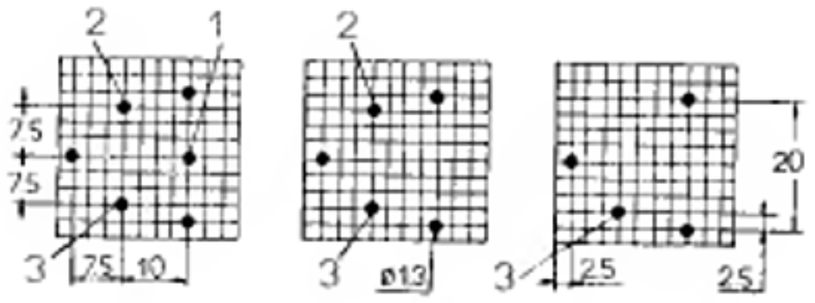
TYPE	D	L
EG 2466	30	60
EG 2470	35	56
EG 2471	35	73
EG 2472	35	73



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	160	250	350
100			30 x 60
220			35 x 73
47 + 47			30 x 60
100 + 100		35 x 56	35 x 73
390 + 220	35 x 73		
47+47+100			35 x 80
100+100+10			35 x 80



Specifications

Item	Characteristics
Climatic Category	25 / 070 / 21
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	160Vdc ... 350Vdc
Capacitance Tolerance	-10% ... +50% ; +/-20%
Leackage Current	I </= 0.03 CV + 20 uA
Tangent of Loss Angle (Max.)	Vdc 160 250 350 Tan.d 0.20 0.20 0.20
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level in the following test conditions : (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100Hz.
Basic specifications	IEC 384-4 G.P. grade

ELECTROLYTIC CAPACITORS

HIGH CAPACITANCE

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EG 7600 SERIES

TYPE	D	L	d	do	h
EG 7691	35	70	10	5.0	12
EG 7692	40	70	15	5.0	12
EG 7693	35	115	10	5.0	12
EG 7694	40	115	15	5.0	12
EG 7695	50	115	15	5.0	12

Dimensions (D x L)

(Size : mm)

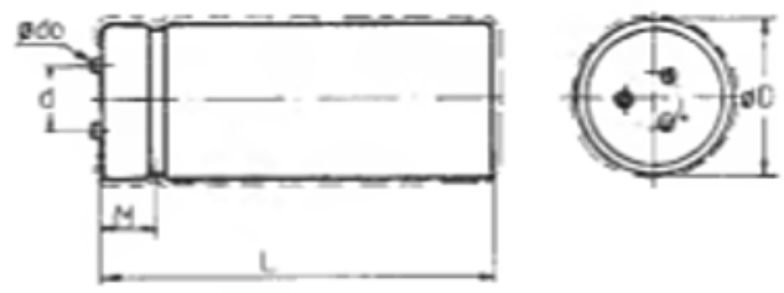
\ Vdc / uF \	16	25	40	63	100	350
680						50 x 115
1000					40 x 70	50 x 115
1500					35 x 115	
2200				35 x 70	40 x 115	
3300			35 x 70	40 x 70	50 x 115	
4700			35 x 70	35 x 115	50 x 115	
6800		35 x 70	40 x 70	40 x 115		
10000	35 x 70	40 x 70	40 x 115	50 x 115		
15000	40 x 70	35 x 115	50 x 115	50 x 115		
22000	35 x 115	40 x 115	50 x 115			
33000	40 x 115	50 x 115				
47000	50 x 115					

Specifications

Item	Characteristics						
Climatic Category	25 / 070 / 21						
Operating Temperature Range	-25°C ... +70°C						
Capacitance Tolerance	-10% ... +50% ; +/-20%						
Leackage Current	I </= 0.03 CV + 20 uA						
Rated Voltage Range	Vdc	16	25	40	63	100	350
Tangent of Loss Angle (Max.)	Tan.d	0.85	0.75	0.75	0.60	0.50	0.20
Reliability	Better than 5 x 10^{-6} h^{-1} with 60% confidence level. Test conditions: (1) Temperature = 40°C ; (2) Rated voltage with maximum permissible ripple current at 100 Hz.						
Basic specifications	IEC 384-4 G.P. grade						

EF 7738 & EP 7700 SERIES

TYPE	D	L	d	do
EF 7738	35	117	13	8.0
EP 7735	35	75	13	8.0
EP 7737	35	100	13	8.0
EP 7738	35	118	13	8.0
EP 7758	51	118	22	8.0



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	7.5	10	25	40	63	350
220						35x75
4700					35x118	
5600					35x118	
6800			35x75	35x118	35x118	
8200				35x118		
10000			35x100	35x118	51x118	
15000				51x118		
33000	35x117	35x118				

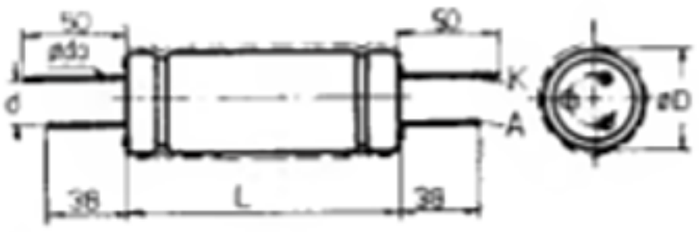
Specifications

Item			Characteristics					
Climatic Category			25 / 070 / 56					
Operating Temperature Range			-25°C ... +70°C					
Capacitance Tolerance			-10% ... +50% ; +/-20%					
			EF 7738	EP 7700 Series				
Rated Voltage Range		V_{dc}	7.5	10	25	40	63	350
Tangent of Loss Angle		Tan.d	0.25	0.6	0.3/0.4	0.25/0.3	0.2/0.25	0.15
Ripple Current @ T_A=70°C;	f=20kHz	max.	12A	5.6A (6800uF/25V) to 14A (10000uF/63V)				
	f=50Hz	max.	5A	3.2A (6800uF/25V) to 8A (10000uF/63V)				
Impedance @ T_A=20°C;	f=10kHz	max.	0.015 ohms	0.04 (33000uF/10V) to 0.065ohms (6800uF/63V)				
Equiv. series resistance,	f=120Hz	max.	0.01 ohms	0.055 (15000uF/40V) to 0.080ohms (6800uF/63V)				
Basic specifications		IEC 384-4 long life						

EF 7217IT SERIES

EF 7217IT Series are capacitors for use as mains filtering in switching power supplies.

TYPE	D	L	d	do
EF 7217IT	26	94	8.5	0.8



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	200
120	26 x 94

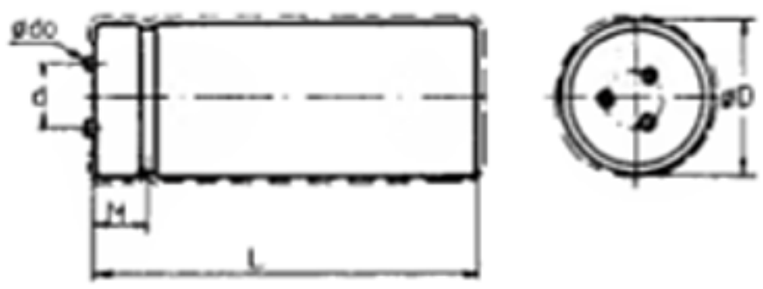
Specifications

Item	Characteristics
Climatic Category	25 / 070 / 56
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	200 Vdc
Capacitance Tolerance	-10 % ... +50 % (+/- 20 % by request)
Tangent of Loss Angle (Max.)	0.20
Ripple Current	max. 0.9A @ TA = 70°C ; f = 20kHz max. 0.4A @ TA = 70°C ; f = 50 Hz
Impedance	0.8 ohms TA = 20°C ; f = 10kHz
Equivalent series resistance	2.0 ohms f = 120 Hz
Basic specifications	IEC 384-4 long life

EP 7738IT SERIES

EP 7738IT Series are high voltage electrolytic capacitors for use in switching power supplies.

TYPE	D	L	d	do	M
EP 7738IT	35	118	13	8.0	4.0



Dimensions (D x L)

(Size : mm)

\ Vdc / uF \	200
680	35 x 118
820	35 x 118

Specifications

Item	Characteristics
Climatic Category	25 / 070 / 56
Operating Temperature Range	-25°C ... +70°C
Rated Voltage Range	200 Vdc
Capacitance Tolerance	-10 % ... +50 % (+/- 20 % by request)
Leakage Current	max. 1 mA @ I_A = 20°C
Tangent of Loss Angle	max. 0.20
Ripple Current	max. 4.2A @ TA = 70°C ; f = 20kHz max. 2.4A @ TA = 70°C ; f = 50 Hz
Impedance	0.26 ohms TA = 20°C ; f = 10kHz
Equivalent series resistance	0.5 ohms f = 120 Hz
Basic specifications	IEC 384-4 long life

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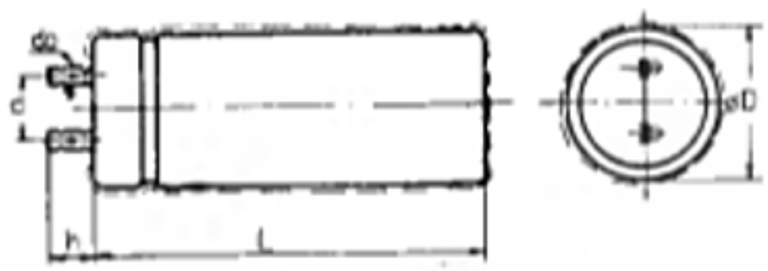
EM 4800 SERIES

ELECTROLYTIC CAPACITORS FOR MOTORS

EM 4800 Series are un-polarised electrolytic capacitors for single-phase electric motors type 3 : 3/0.55 .

TYPE	D	L	d	do	h
EM 4892	35	75	6	5	12
EM 4893	35	88	6	5	12



Dimensions (D x L)

(Size : mm)

uF \ Vac	220
80	35 x 75
100	35 x 88

Specifications

Item	Characteristics
Climatic Category	10 / 055 / 21
Operating Temperature Range	$-10^{\circ}C$ ... $+55^{\circ}C$
Rated Voltage Range	220 Vac
Capacitance Tolerance	-10 % ... +50 % (0 ... +30% by request)
Tangent of Loss Angle	max. 0.15 @ $T_A = 25^{\circ}C$, f = 80...120Hz
Reliability	Better than 1×10^{-6} h^{-1} with 60% confidence level in the following conditions : (1) Temperature = $40^{\circ}C$; (2) Rated voltage with maximum permissible ripple current at 100Hz.

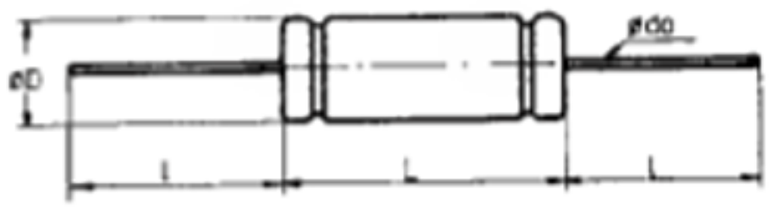
QUICK REFERENCE GUIDE (Cont.)

Configuration	Type	Voltage range	Capacitance range	Capacit. tolerance	Load life	Size (mm) min.	Size (mm) max.	Page
	MPPA MPSA Fluorescent lamps	220 V_{ac} to 380 V_{ac}	4.0 uF to 25 uF	± 10%	500 h. + 85 °C	30x68	40x96	105
	MPM Motors	400 V_{ac}	2.5 uF to 50 uF	± 10%	1000 h. + 70 °C	30x68	50x152	105

HC 2400 SERIES

HC 2400 Series are used in DC circuits of industrial equipments, radioreceivers and TV sets for coupling, decoupling and filtering.

TYPE	D	L	l	do
HC 2416	10	26	45	0.8
HC 2421	12	26	45	0.8
HC 2423	12	34	45	0.8
HC 2428	14	34	45	0.8
HC 2430	14	39	45	0.8
HC 2435	16	39	45	0.8
HC 2447	18	39	45	0.8
HC 2448	18	53	45	0.8
HC 2455	20	53	45	0.8



Dimensions (D x L)

(Size : mm)

µF \ V_{dc}	630	1000	1300
0.010	10 x 26	10 x 26	
0.015	12 x 26	12 x 26	
0.022	12 x 26	12 x 34	
0.033	12 x 34	14 x 34	
0.047	12 x 34	14 x 34	16 x 39
0.056			16 x 39
0.068	14 x 34	16 x 39	
0.1	14 x 39	18 x 39	
0.15	16 x 39	18 x 53	
0.18	18 x 39		
0.22	18 x 39	20 x 53	
0.33	18 x 53		
0.47	20 x 53		

Specifications

Item	Characteristics
Operating Temperature Range	$-25^{o}C$ ... $+85^{o}C$
Rated Voltage Range	630Vdc ... 1300Vdc
Capacitance Tolerance	+/-20% (+/-10% , +/-5% by request)
Tangent of Loss Angle	</= 0.01 at T = $20^{o}C$; f = 1kHz
Insulation Resistance	>/= 6000 Mohms for C </= 0.33 uF RC >/= 2000 sec. for C > 0.33 uF at V = 500 Vdc ; T = $20^{o}C$; t = 1 min.
Proof voltage between terminals	2 Vn t = 1 min.
Proof voltage between interconnected terminals and case	2 Vn t = 1 min.

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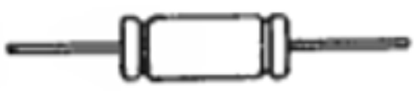
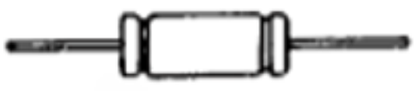
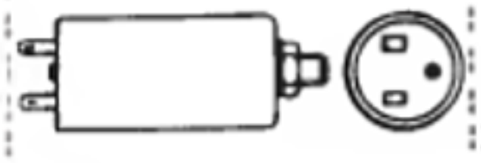
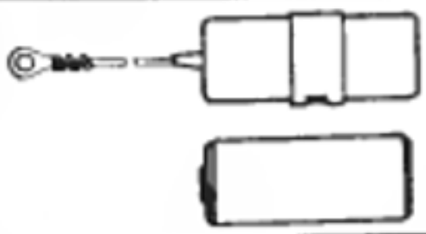
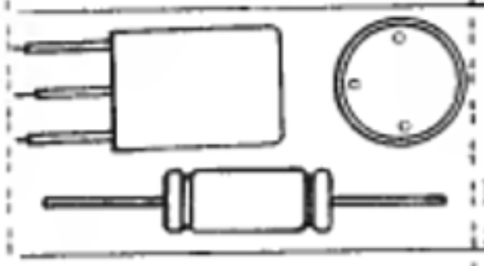
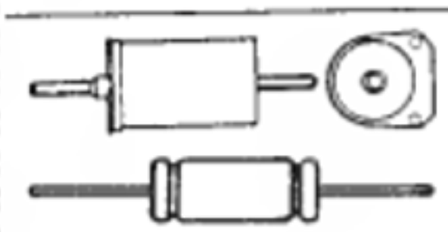
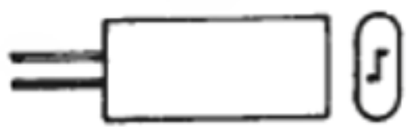
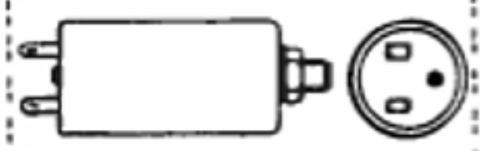
QUICK REFERENCE GUIDE

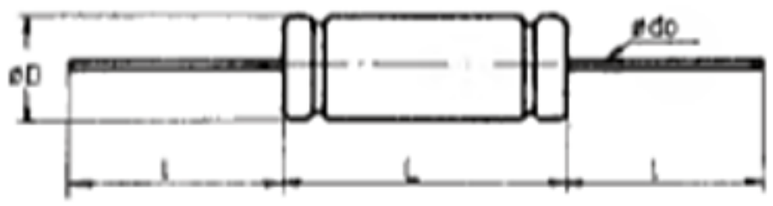
Configuration	Type	Voltage range	Capacitance range	Capacit. tolerance	Load life	Size (mm) min.	Size (mm) max.	Page
	HC 2400 General purpose	630 V_{dc} to 1300 V_{dc}	0.01 uF to 0.47 uF	± 20% (± 10% , ± 5% by request)	1000 h. + 85 °C	10x26	20x53	98
	HPI Voltage pulses	400 V_p to 1500 V_p	1.0 nF to 470 nF	± 10%	1000 h. + 85 °C	12x33	20x53	99
	HPR Rectifier protection	400 V_{ac} to 800 V_{ac}	0.47 uF to 1.0 uF	± 10%	1000 h. + 70 °C		30x56	99
	HS Automotive filter	automotive 12 V_{dc}	0.22 uF, 0.22 uF, 0.26 uF, 0.27 uF	0 /+15% ± 20% ± 10% ± 5%	1000 h. + 85 °C + 85 °C +100 °C +100 °C	17.5x30.5	17.5x48.5	100
	HZ Multiple suppression	250 V_{ac}	0.10 uF + 2x 2500pF to 0.47 uF + 2x27000pF	± 20% ± 30%	1000 h. + 85 °C	18x39	30x43	101
	PMZ By-pass, suppression	40 V_{dc} to 110 V_{dc}	1.0 uF to 8.2 uF	± 10% ± 20%	1000 h.	18x40	45x70	102
	HPA Fluorescent lighting	220 V_{ac}	4.0 uF to 10 uF	± 10%	500 h. + 85 °C	35x68	40x120	103
	HSA Fluorescent lighting	380 V_{ac}	3.7 uF to 5.9 uF	± 10%	500 h. + 85 °C	40x84	40x120	103
	HS 7101 Fluorescent starter	220 V_{ac}	0.01uF	± 30%	200 h. + 25 °C		28.5 x x13x4.7	103
	HAM Motor run	250 V_{ac} to 400 V_{ac}	3.0 uF to 4.0 uF	± 10%	1000 h. + 70 °C	35x68	40x68	104
	HMPM Motor run	400 V_{ac} to 450 V_{ac}	7.5 uF to 25 uF	± 10%	1000 h. + 70 °C	40x86	50 x152	104
	HMPT Thyristor protection	1400 V_{ac}	0.47uF to 1.0 uF	± 10%	1000 h. + 70 °C	40x92	40x138	104

BANEASA S.A.

HPI SERIES

HPI Series are used in pulse generators, such as the horizontal sweep stage of TV receivers.

TYPE	D	L	lmin	do
HPI 1233	12	33	45	0.8
HPI 1433	14	33	45	0.8
HPI 1640	16	40	45	0.8
HPI 1853	18	53	45	0.8
HPI 2053	20	53	45	0.8



Dimensions (D x L)

(Size : mm)

V_p \ V_v / µF	400	630	800	1500
0.001				12 x 33
0.024				12 x 33
0.0047				14 x 33
0.0075				14 x 33
0.022	12 x 33			
0.027	12 x 33			
0.033		12 x 33		
0.068	14 x 33			18 x 53
0.082	14 x 33			
0.1	14 x 33			
0.15	16 x 40		20 x 53	
0.18			20 x 53	
0.47	20 x 53			

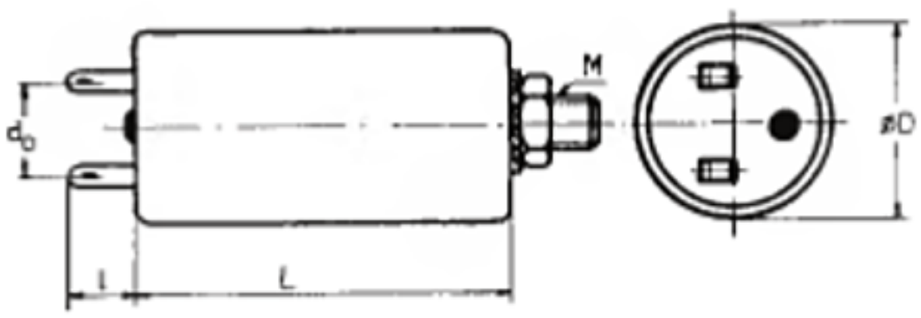
Specifications

Item	Characteristics
Operating Temperature Range	-25°C ... +85°C
Rated Voltage Range	400Vv ... 1500Vv (Vp)
Capacitance Tolerance	+/-10 %
Tangent of Loss Angle	</= 0.003 at T = 20°C ; f = 1kHz
Insulation Resistance	>/= 50000 Mohms at V = 500 Vcc ; T = 20°C ; t = 1 min.
Proof voltage between terminals	2 Vn t = 1 min.
Proof voltage between interconnected terminals and case	2 Vn t = 1 min.

HPR SERIES

HPR Series are mixt dielectric capacitors for rectifier protection.

TYPE	D	L	l	do	M
HPR 3056	30	56	10	10	8



Dimensions (D x L)

(Size : mm)

V_{ac} \ µF /	400	800
0.47		30 x 56
0.80	30 x 56	
1	30 x 56	

Specifications

Item	Characteristics
Operating Temperature Range	-40°C ... +70°C
Rated Voltage Range	400Vcc ... 800Vdc
Capacitance Tolerance	+/-10 %
Tangent of Loss Angle	</= 0.01 at T = 20°C ; f = 1kHz
Insulation Resistance	>/= 6000 Mohms at V = 500 Vdc ; T = 20°C ; t = 1 min.
Proof voltage between terminals	4.3 Vn t = 1 min.
Proof voltage between interconnected terminals and case	4 Vn + 1000 V t = 1 min.

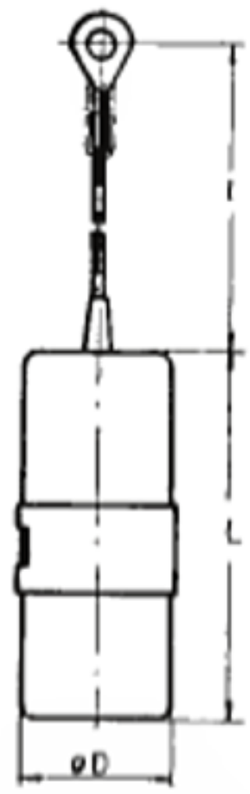
PAPER CAPACITORS

AUTOMOTIVE FILTER

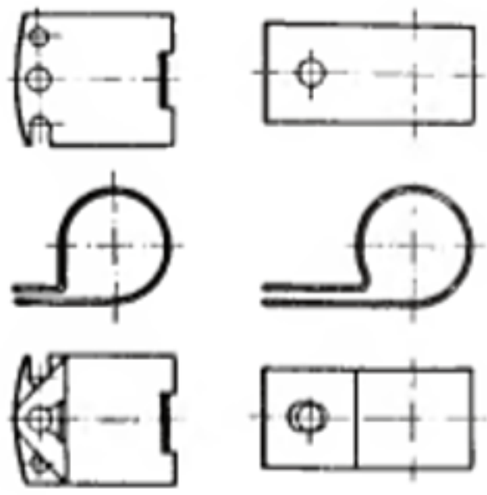
BANEASA S.A.

HS SERIES

HS Series are motor car equipment capacitors, suitable for parallel connection to the ignition points.



HS 6500 Series



Collars

HS 6722

HS 6860

Dimensions and Construction

TYPE	Cn (uF)	DIMENSIONS D (mm)	L (mm)	l (mm)	CONSTRUCTION	NOTES
HS 6510	0.22	17.5	39.5	45	with slipper only	
HS 6511	0.22	17.5	39.5	45	with collar "A" & slipper	
HS 6513	0.22	17.5	39.5	45	with collar "A" only	
HS 6520	0.22	17.5	39.5	75	with slipper only	
HS 6521	0.22	17.5	39.5	75	with collar "A" & slipper	
HS 6522	0.22	17.5	39.5	75	with collar "B" & slipper	
HS 6524	0.22	17.5	39.5	75	with collar "B" only	
HS 6530	0.22	17.5	39.5	110	with slipper only	
HS 6541	0.22	17.5	39.5	275	with collar "A" & slipper	
HS 6543	0.22	17.5	39.5	275	with collar "A" only	
HS 6550	0.22	17.5	30.5	90	without collar or slipper	
HS 6722	0.27	17.5	48.5	75	with collar "B" & slipper	For CLTCIT car motor
HS 6860	0.26	17.5	30.5		with connection terminal "C"	

Specifications

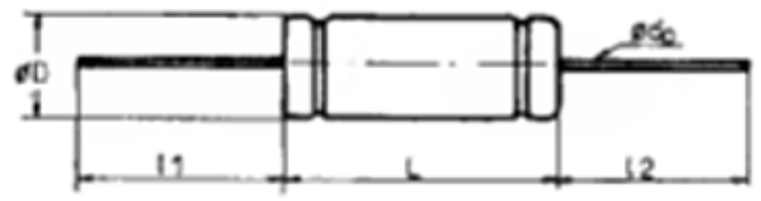
Item		Characteristics
Operating Temperature Range	HS 6500 Series	-40°C ... + 85°C
	HS 6722	-40°C ... +100°C
	HS 6860	-40°C ... +100°C
Capacitance Tolerance	HS 6510...6543	0 ... +15 %
	HS 6550	+/- 20 %
	HS 6722	+/- 5 %
	HS 6860	+/- 10 %
Tangent of Loss Angle	HS 6500 Series	</= 0.010
	HS 6722	</= 0.005
(T = 25°C ; f = 1 kHz)	HS 6860	</= 0.005
Insulation Resistance	HS 6510...6543	>/= 6000 Mohms
	HS 6550	>/= 6000 Mohms
(V = 500 ± 50 V_{dc} ; T=20°C ;	HS 6722	>/= 6000 Mohms
after t=1 min.)	HS 6860	>/= 4000 Mohms
Proof voltage at 20°C	HS 6510...6543	1200 Vdc ; t = 2 sec.
		1000 Vac ; t = 5 sec.
		330 Vac ; t = 1 hour
	HS 6550	600 Vdc ; t = 2 sec.
	HS 6722	1200 Vdc ; t = 2 sec.
		1000 Vac ; t = 5 sec.
		330 Vac ; t = 1 hour
	HS 6860	600 Vdc ; t = 5 sec.
		750 Vac ; t = 10 sec.
		330 Vac ; t = 1 hour
Proof voltage at 85°C	HS 6500 Series	220 Vac ; t = 1 hour
Proof voltage at 100°C	HS 6722	220 Vac ; t = 1 hour
	HS 6860	150 Vac ; t = 1 hour

BANEASA S.A.

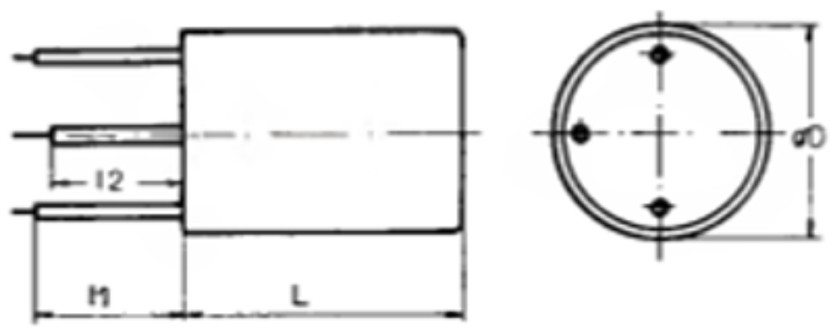
HZ SERIES

MULTIPLE SUPPRESSION CAPACITORS

TYPE	D	L	l1	l2	do
HZ 9401	18	39	45	45	0.8
HZ 9402	18	39	45	45	0.8



TYPE	D	L	l1	l2
HZ 9403	20	48	80	5
HZ 9404	30	43	40	30

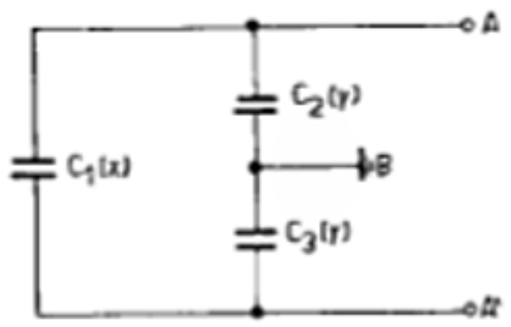


Dimensions (D x L)

(Size : mm)

TYPE	CnA'C = \ Vac = CnAA + 2x CnAC \	250
HZ 9401	0.10uF + 2x 2500pF	18 x 39
HZ 9402	0.22uF + 2x 2500pF	18 x 39
HZ 9403	0.22uF + 2x 22000pF	20 x 48
HZ 9404	0.47uF + 2x 27000pF	30 x 43

Connection Diagram



Specifications

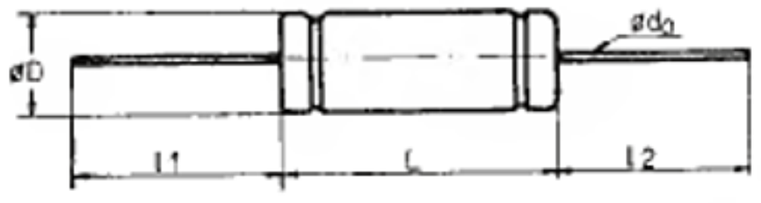
Item		Characteristics
Operating Temperature Range		-25°C ... +85°C
Rated Voltage Range		250Vac
Capacitance Tolerance	for CnAA'	+/- 20 %
	for CnAC / CnA'C	+/- 30 % (HZ 9401 & HZ 9402)
	for CnAC / CnA'C	+/- 20 % (HZ 9403 & HZ 9404)
Capacitor Class	for CnAA'	class X
	for CnAC	class Y
	for CnA'C	class Y
Insulation Resistance		>/= 6000 Mohms
Proof voltage (t = 60 sec.)	for CnAA'	1075 Vdc
	for CnAC & CnA'C	1500 Vac
Proof voltage between interconnected terminals and case		2000 Vdc t = 60 sec.

BANEASA S.A.

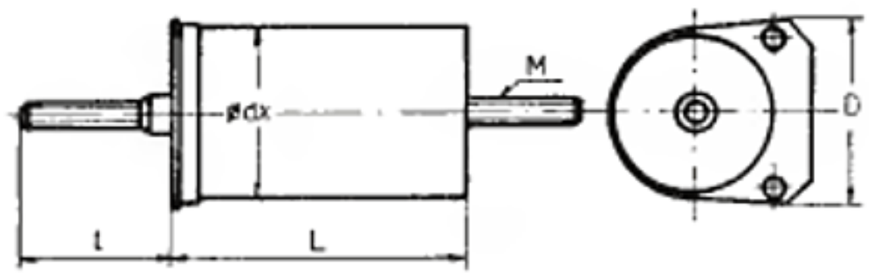
PMZ SERIES

SUPPRESSION BY-PASS CAPACITORS

TYPE	D	L	l1	l2	do
PMZ 6401	18	40	60	60	2.0



TYPE	D	L	l	dx	M
PMZ 6411	45	70	30	36	8
PMZ 6412	45	70	30	36	8



Dimensions (D x L)

(Size : mm)

TYPE	\ Vdc / uF \	40	110
PMZ 6401	1		18 x 40
PMZ 6411	8.2	45 x 70	
PMZ 6412	8.2	45 x 70	

Specifications

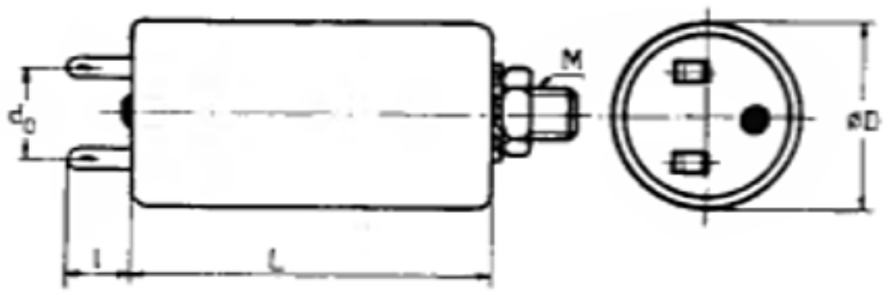
Item		Characteristics
Operating Temperature Range	PMZ 6401	-40°C ... +70°C
	PMZ 6411	-40°C ... +85°C
	PMZ 6412	-65°C ... +70°C
Rated Voltage Range		40Vdc ... 110Vdc
Capacitance Tolerance		+/- 10 %
Tangent of Loss Angle		</= 0.02
	PMZ 6401	at T = 20°C ; f = 1kHz
	PMZ 6411	at T = 20°C ; f = 50Hz
	PMZ 6412	at T = 20°C ; f = 50Hz
Insulation Resistance	PMZ 6401	>/= 2000 Mohms
		at V = 100Vdc ; T = 20°C ; t = 1 min.
	PMZ 6411	>/= 244 Mohms
		at V = 25Vdc ; T = 20°C ; t = 1 min.
	PMZ 6412	>/= 100 Mohms
		at V = 100Vdc ; T = 20°C ; t = 1 min.
Proof voltage between terminals	PMZ 6401	330 Vdc
		t = 1 min.
	PMZ 6411	250 Vdc
		t = 1 sec.
	PMZ 6412	100 Vdc
		t = 1 sec.

BANEASA S.A.

HPA & HSA SERIES

HPA and HSA Series are A.C. oil impregnated paper capacitors for paralel (HPA) or serial (HSA) connection with fluorescent lamps.

TYPE	D	L	l	do	M
HPA 3506	35	68	10	10	8
HPA 3524	35	84	10	10	8
HPA 4058	40	120	10	10	8
HSA 3530	35	92	10	10	8
HSA 4024	40	84	10	10	8
HSA 4030	40	92	10	10	8
HSA 4056	40	120	10	10	8



Dimensions HPA

(Size : mm)

V_{ac} / uF	220
4	35 x 68
5	35 x 84
10	40 x120

Dimensions HSA

(Size : mm)

V_{ac} / uF	380
3.7	40 x 84
3.75	35 x 92
4.2	40 x 84
5	40 x 92
5.9	40 x120

Specifications

Item	Characteristics
Operating Temperature Range	-25°C ... +85°C
Rated Voltage Range	220Vac & 380Vac
Capacitance Tolerance	+/- 10 %
Tangent of Loss Angle	</= 0.008 at T = 15°C ... 35°C ; f = 50 Hz ; V = max.Vn
Proof voltage between terminals	2.15 Vn t = 1min.
Proof voltage between interconnected terminals and case	6 Vn t = 1min.

HS 7101

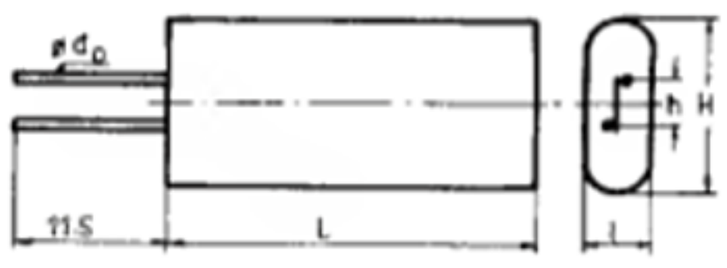
HS 7101 oil impregnated paper capacitors are specially designed for the starters needed by the flucrescent lamps.

TYPE	L	H	l	h	do
HS 7101	28.5	13	4.7	3.5	0.5

Dimensions (D x L)

(Size : mm)

V_{ac} / uF	220
0.01	28.5 x 13 x 4.7



Specifications

Item	Characteristics
Operating Temperature Range	-10°C ... +70°C
Rated Voltage Range	220Vac
Capacitance Tolerance	+/- 30 %
Tangent of Loss Angle	</= 0.01 at T = 20°C ; f = 1 kHz
Insulation Resistance	>/= 50000 Mohms at V = 100Vdc ; T = 20°C ; t = 1min.
Proof voltage between terminals	3600 Vdc t = 1 sec.

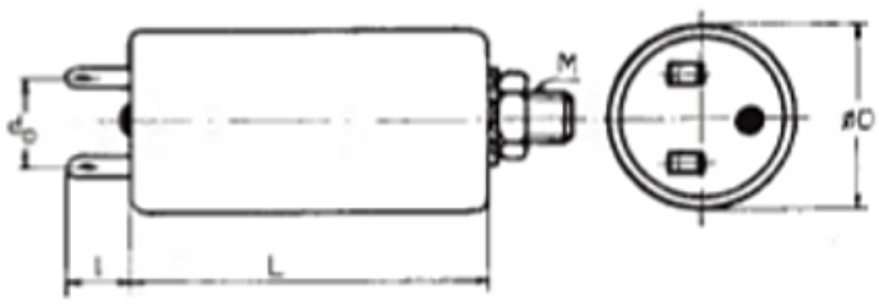
SPECIAL TYPES

BANEASA S.A.

HAM , HMPM & HMPT SERIES

HAM Series are paper capacitors for motors.
HMPM Series are capacitors of "MKV" construction for motors.
HMPT Series are capacitors of "MKV" construction for thyristor protection.

TYPE	D	L	l	do	M
HAM 2706-240	35	68	10	10	8
HAM 2706-240	40	68	10	10	8
HAM 2722-240	35	84	10	10	8
HAM 2730-240	35	92	10	10	8
HAM 2806-240	40	68	10	10	8
HMPM 4086-240	40	86	10	10	8
HMPM 4090-240	40	92	10	10	8
HMPM 50138-260	50	138	10	14	12
HMPM 50152-260	50	152	10	14	12
HMPT 4092	40	92	10	10	8
HMPT 40138	40	138	10	10	8



Dimensions (D x L)

(Size : mm)

TYPE	\ V_{ac} / uF \	250	380	400	450	1400	Max. Tangent of Loss Angle
HAM 2722-240	3			35 x 84			0.006
HAM 2706-240	3.5		40 x 68				0.006
HAM 2806-240	3.5		40 x 68				0.010
HAM 2730-240	3.75		35 x 92				0.006
HAM 2706-240	4	35 x 68					0.006
HAM 2730-240	4			35 x 92			0.006
HAM 2806-240	2.5			40 X 68			0.010
HMPM 4090-240	7.5			40 x 92			0.006
HMPM 4086-240	10			40 x 86			0.010
HMPM 50138-260	15				50 x 138		0.010
HMPM 50138-260	20			50 x 138			0.010
HMPM 50152-260	25			50 x 152			0.010
HMPT 4092	0.47					40 x 92	0.0003
HMPT 4092	0.56					40 x 92	0.0003
HMPT 40138	1					40 x 138	0.0003

Specifications

Item	Characteristics	
	HAM & HMPM Series	HMPT Series
Operating Temperature Range	-25°C ... +70°C	-40°C ... +70°C
Rated Voltage Range	250Vac ... 450Vac	1400Vac
Capacitance Tolerance	+/- 10%	+/- 10%
Tangent of Loss Angle	See table below at T=25°C ; f=50Hz	</= 0.0003 at T=25°C ; f=50Hz
Insulation Resistance	for Vn </= 500Vca : >/= 200 Mohms at=100Vdc ; T=20°C ; after t=2 min. for 15uF / 450Vca : >/= 200 Mohms at V=500Vdc; T=20°C; after t=2 min.	>/= 3000 Mohms , at: V=500Vdc; T=20°C; after t=1 min.
Proof voltage between terminals	2.15 Vn t = 10sec.	2.15 Vn t = 10 sec.
Proof voltage between interconnected terminals and case	2 Vn + 1000 Vac t = 2 min.	2 Vn + 1000 Vac t = 1 min.

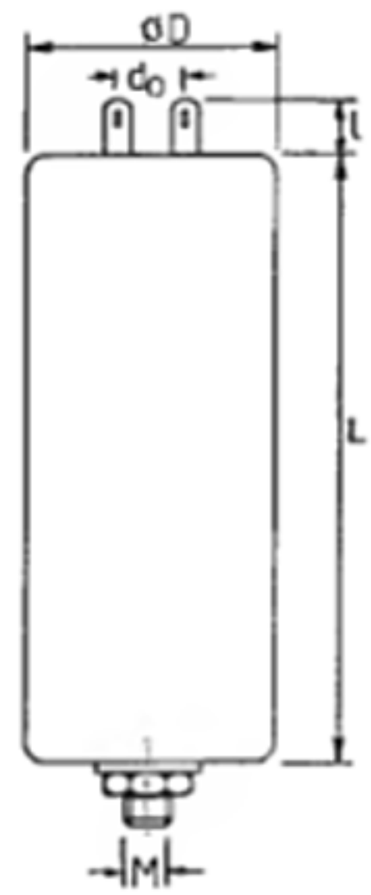
BANEASA S.A.

METALLISED POLYPROPYLENE FILM CAPACITORS FOR A.C. USE

MPPA and MPSA are A.C. metallised polypropylene film capacitors for paralel (MPPA) or series (MPSA) connection with fluorescent lamps.

MPM series are A.C. metallised polypropylene film capacitors for motors.

TYPE	uF \ Vac				DIMENSIONS				
	220	250	380	400	D	L	l	do	M
MPPA 3006	4; 5 $				30	68	10	10	8
MPSA 3006			3.75; 4.2 $						
MPM 3068-240		4; 5 $ $	3.5 ; 3.75 $	2.5 $					
MPPA 3506	10				35	68	10	10	8
MPSA 3506			5.0 ; 5.9 $ $						
MPM 3568-240				7.5 $					
MPPA 3530	20				35	94	10	10	8
MPM 4068-240				10 $	40	68	10	10	8
MPPA 4030	25				40	94	10	10	8
MPM 4090-240				15; 20 $ $					
MPM 40120-240				25 $	40	120	10	10	8
MPM 50138-260				40; 45 $ $	50	138	10	14	12
MPM 50152-260				50 $	50	152	10	14	12



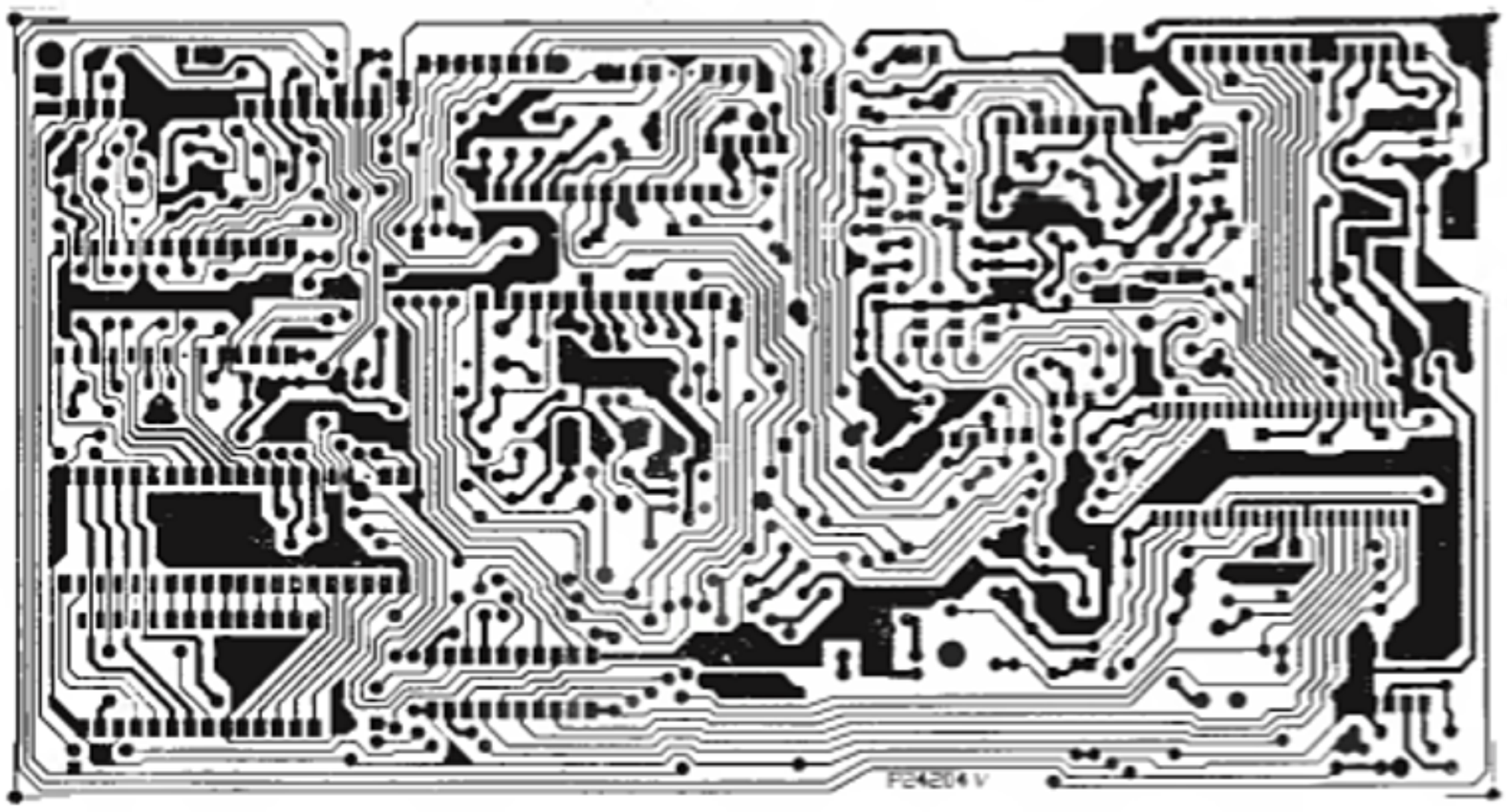
$ Preliminary data

Specifications

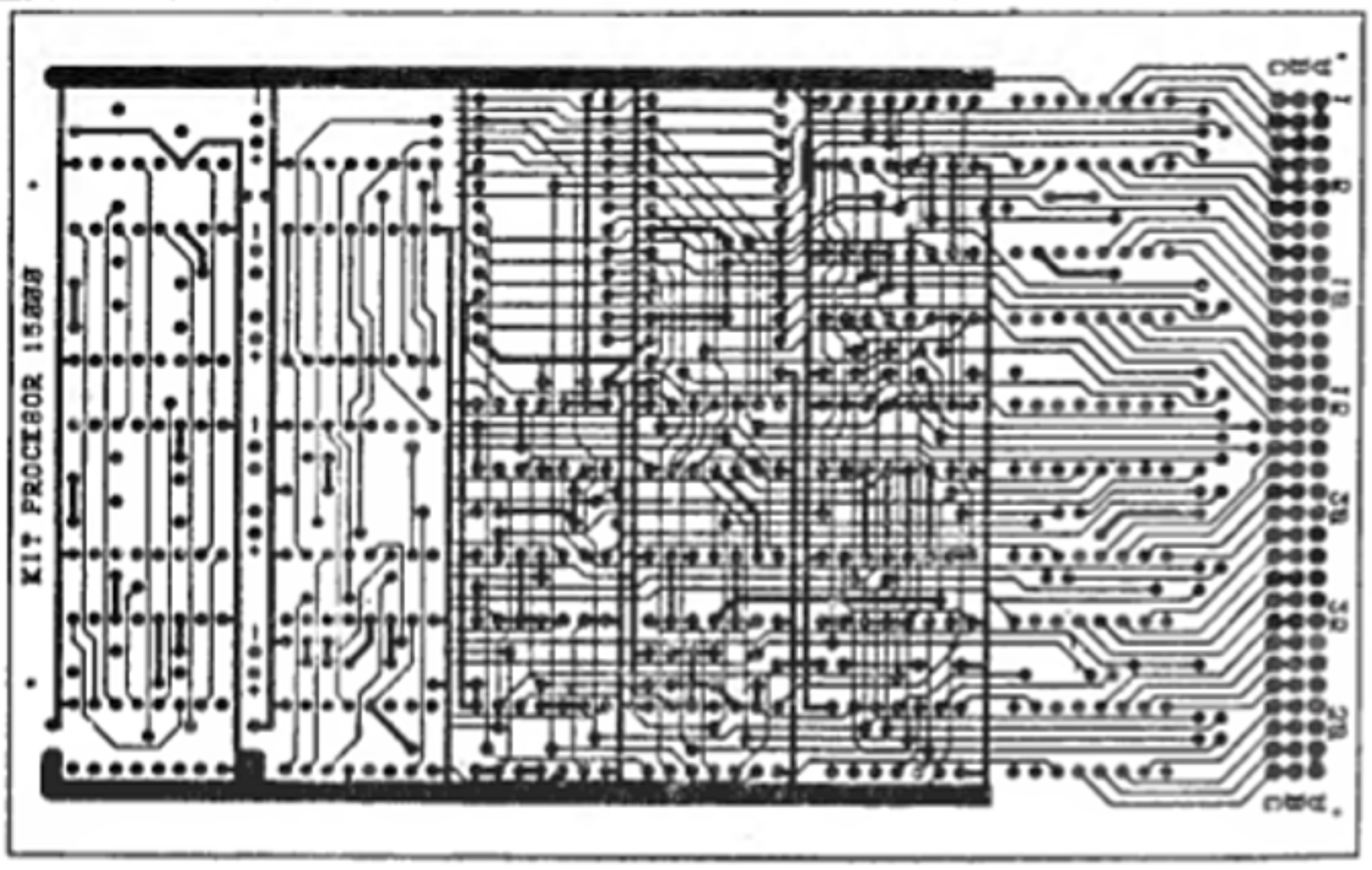
Item	Characteristics	
	MPPA & MPSA Series	MPM Series
Climatic Category	25 / 085 / 21	25 / 070 / 21
Rated Voltage Range	As to the table	
Capacitance Tolerance	±4% ±10%	± 10 %
Tangent of Loss Angle at 20°C	max. 8×10^{-3} @ f=50 Hz	max. 6×10^{-3} @ f=50 Hz
Insulation Resistance at 20°C 100 V_{cc} 1 min:		
- between terminals		min. 200 Mohms
- between interconnected terminals and case		

BANEASA S.A.

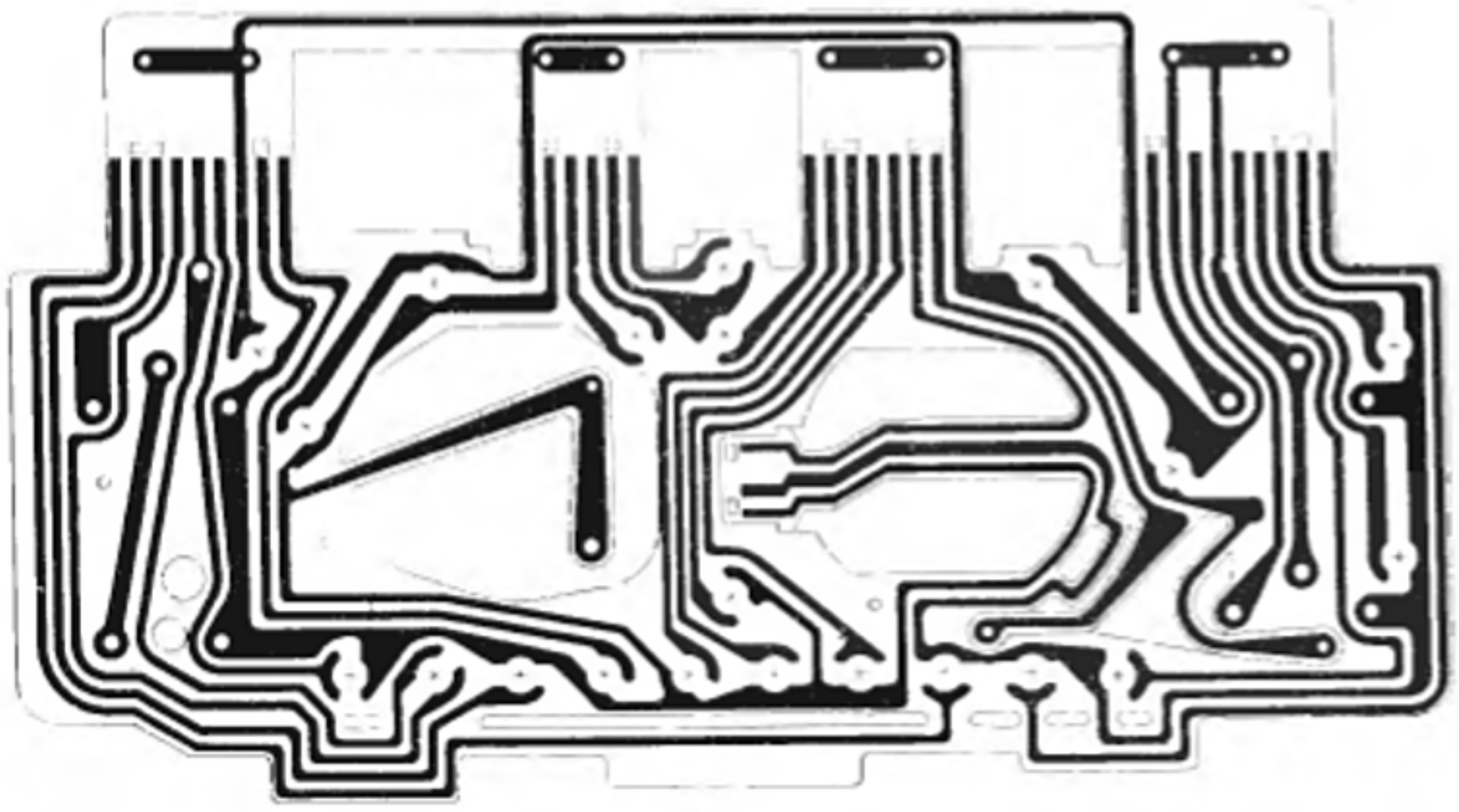
SINGLE-SIDE P.C.B.s



DOUBLE-SIDE P.C.B.s

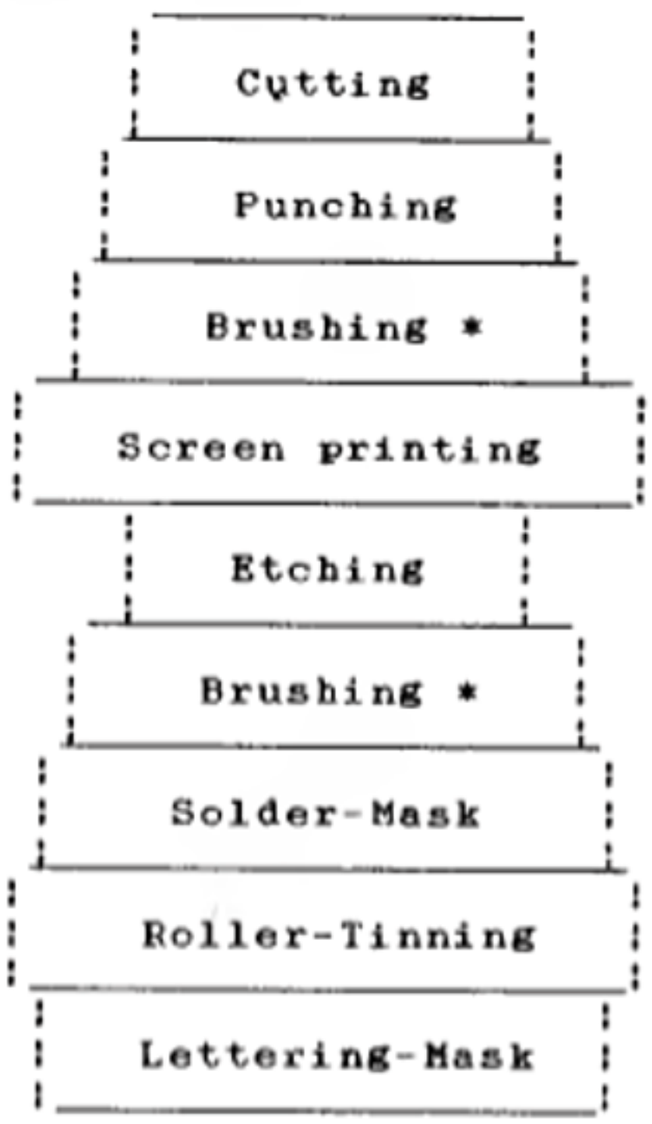


FLEXIBLE P.C.B.s



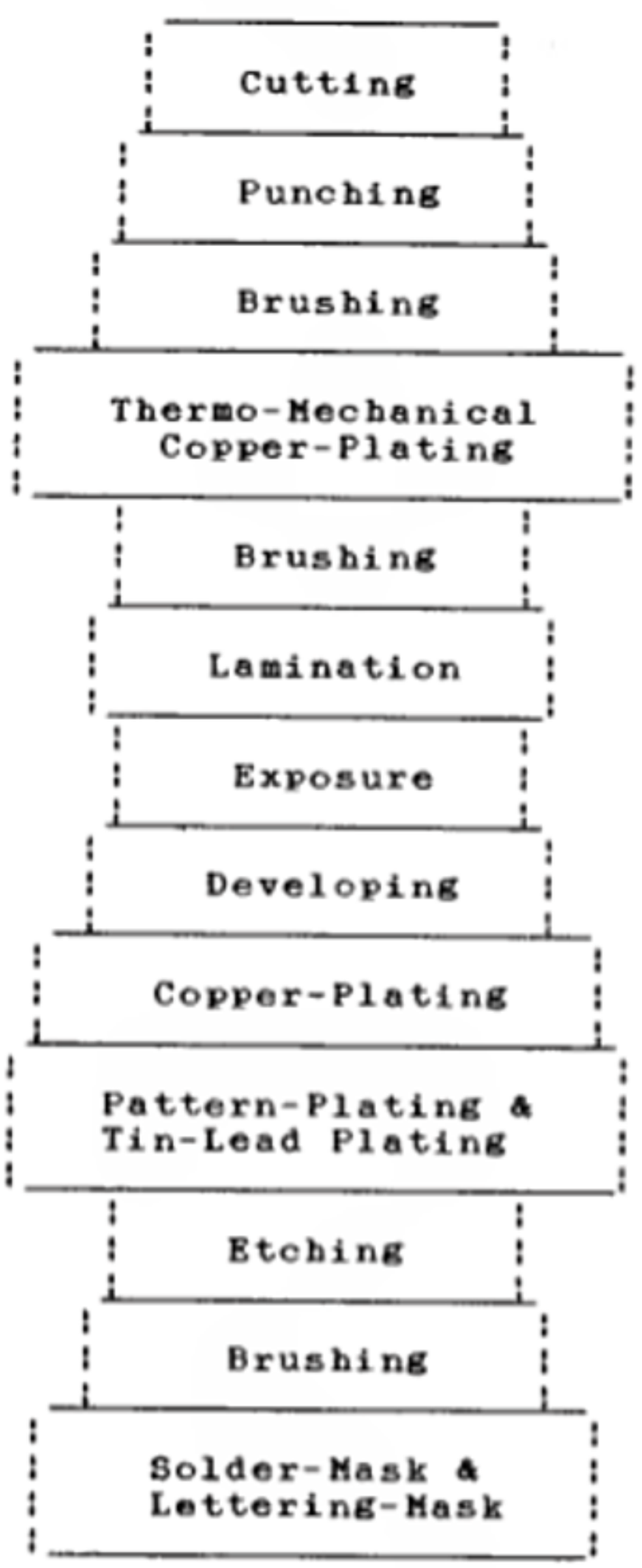
Processing-Flow Diagrams

Single-Side & Flexible



* For Single-Side P.C.B.s only

Double-Side



Technical Characteristics

Item	Single-Side	Double-Side	Flexible
Maximum Board Size	400 x 500 mm	350 x 500 mm	220 x 300 mm
Minimum Circuit-Line Width	0.4 mm	0.30 mm	0.45 mm
Minimum Circuit-Line Spacing	0.45 mm	0.30 mm	0.45 mm
Minimum Hole Size	0.8 mm	0.70 mm	0.90 mm
Copper-Thickness Available	35 um	35 um	35 um
Available Laminate	FR 2 , FR 4	FR 4	
Manufacturing Capabilities	80,000 sqm/year	2,500 sqm/year	8,000 sqm/year

Electro-mechanical characteristics according to : IEC 326-2 , IEC 327-3 , IEC 489-1.

P O W E R B L O C K S

Rectifier Bridges _____ page 110

Diode-Diode _____ page 113

Thyristor-Thyristor _____ page 115

Cooled Power Devices _____ page 116

Switches & Controllers _____ page 117

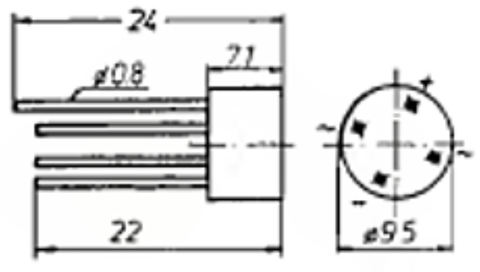
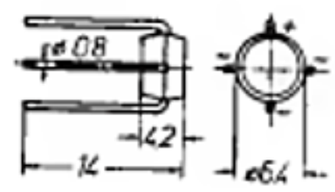
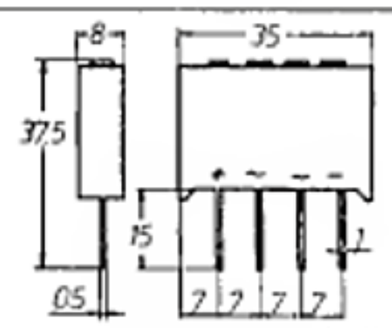
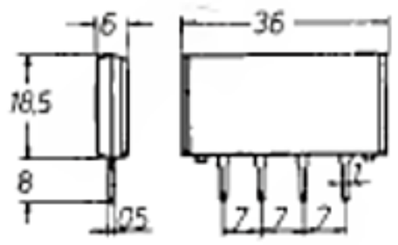
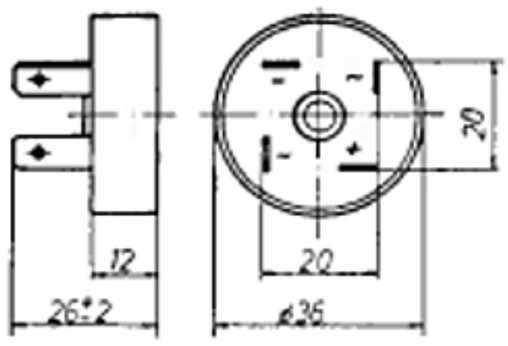
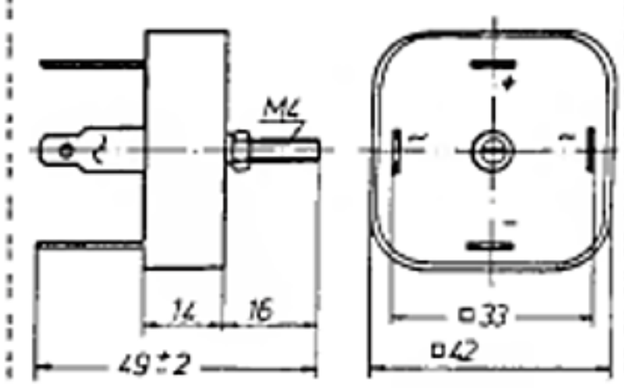
Single-Phase Power Bridges _____ page 116

Three-Phase Power Bridges _____ page 119

RECTIFIER BRIDGES

BANEASA S.A.

SINGLE-PHASE RECTIFIER BRIDGES

TYPE	I_d @ T_A (T_C*) max. (A)	(^oC)	V_{RRM} (V)	I_{FSM} (A)	I_r @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)	r_s max. (ohms)	C_l max. (mF)	CASE STYLE
1.2 A / T_A = 45 °C T_{JM} = 150°C i^2t = 3A^2s R_{thJ-A} = 50 °C/W									
1PM 05	1.2	45	50	30	0.01	1.0 +	1	3.5	
1PM 1			100				1.3	1.8	
1PM 2			200				3.3	1	
1PM 4			400				6.8	0.5	
1PM 6			600				11	0.3	
1PM 8			800				15	0.2	
					+ T_J=125°C				
1.5 A / T_A = 45 °C T_{JM} = 150°C i^2t = 6A^2s R_{thJ-A} = 50 °C/W									
B 40C 1500	1.5	45	80	50 #	0.01	1.0	0.5	5	
B 80C 1500			160				1	2.5	
B125C 1500			250				1.5	1.5	
B250C 1500			500				2.5	0.8	
B500C 1500			1000				5	0.4	
				# T_J=25°C					
3.2 A / T_A = 45 °C T_{JM} = 150°C i^2t = 24A^2s R_{thJ-A} = 50 °C/W									
3PM 05	3.2	45	50	50	0.02	1.0	0.3	5	
3PM 1			100				0.5	5	
3PM 2			200				1	2.5	
3PM 4			400				3	1	
3PM 6			600				3	1	
3PM 8			800				5	0.5	
4.0 A / T_A = 45 °C T_{JM} = 150°C i^2t = 50A^2s R_{thJ-A} = 50 °C/W									
4PM 05	4.0	45	50	100 #			0.3	5	
4PM 1			100				0.5	5	
4PM 2			200				1	2.5	
4PM 4			400				3	1	
4PM 6			600				3	1	
4PM 8			800				5	0.5	
				# T_J=25°C					
10 A / T_C = 80 °C T_{JM} = 125°C i^2t = 162A^2s R_{thJ-A} = 50 °C/W									
10PM 05	10	80*	50	180	0.10	3.0 +	0.3	10	
10PM 1			100				0.5	5	
10PM 2			200				1.1	2.5	
10PM 4			400				2.2	1.5	
					+ T_J=125°C				
20 A / T_C = 70 °C T_{JM} = 150°C i^2t = 313A^2s R_{thJ-A} = 50 °C/W									
20PM 03	20	70*	30	250	0.10				
20PM 05			400						
20PM 1			100						
20PM 2			200						
20PM 4			400						

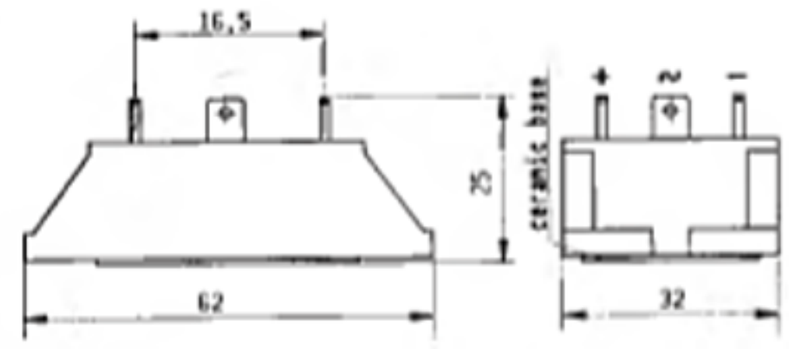
BANEASA S.A.

RECTIFIER BRIDGES

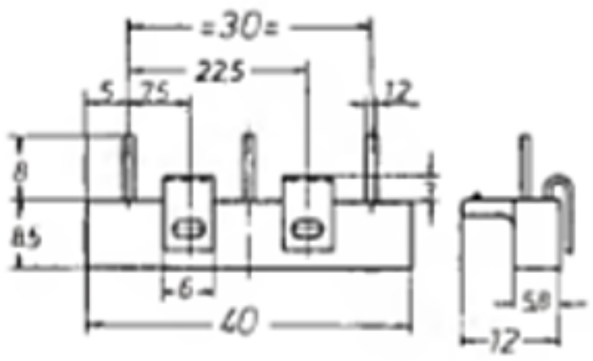
SINGLE-PHASE RECTIFIER BRIDGES (Cont.)

TYPE	I_d @ T_A (T_C*) max. (A) (^oC)	V_{RRM} (V)	I_{FSM} (A)	I_r @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)	r_s max. (ohms)	C_1 max. (mF)	CASE STYLE
30A / T_C=85°C T_{JM}=150°C i^2t=1250A^2s $R_{thJ-Cmin}$=3.2°C/W Tight.Torque=4Nm								
30PM 03	30 85 *	30	250	0.03	2			30 PM
30PM 05		50						
30PM 1		100						
30PM 2		200						
30PM 4		400						
30PM 6		600						
30PM 8		800						
30PM 9		900						
30PM 10		1000						

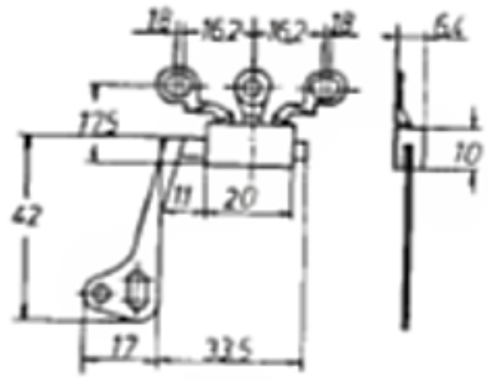
THREE-PHASE CAR ENGINE RECTIFIER BRIDGES



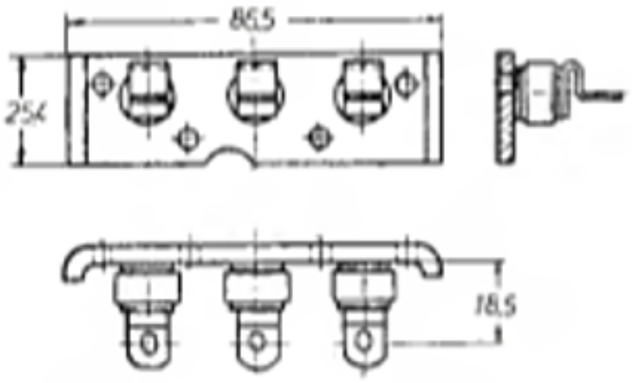
CASES : 30 PM



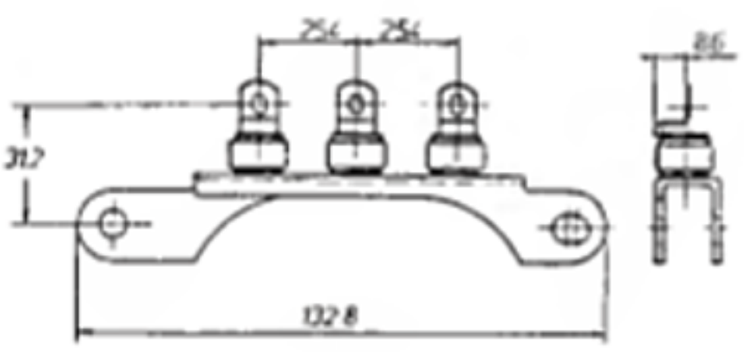
4PT 2



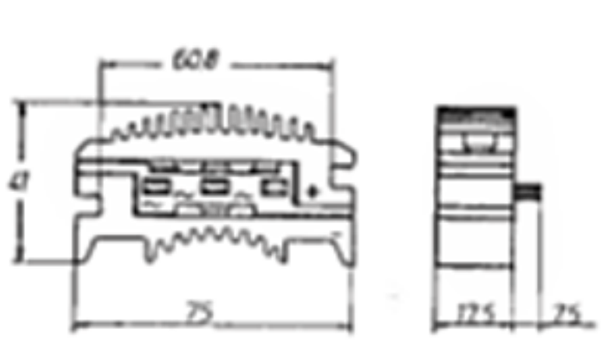
4PTM 2



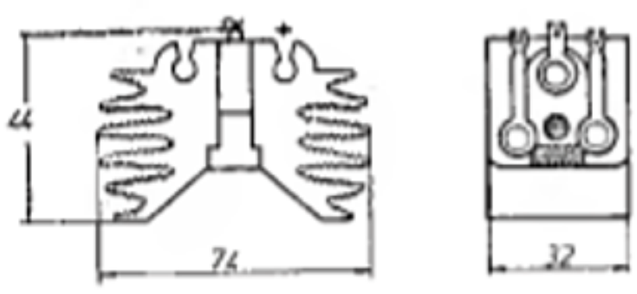
CASES : 1C 1202



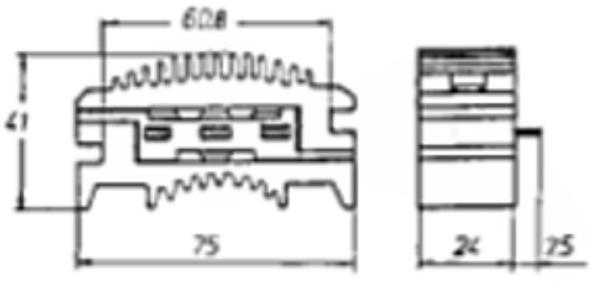
1C 1203



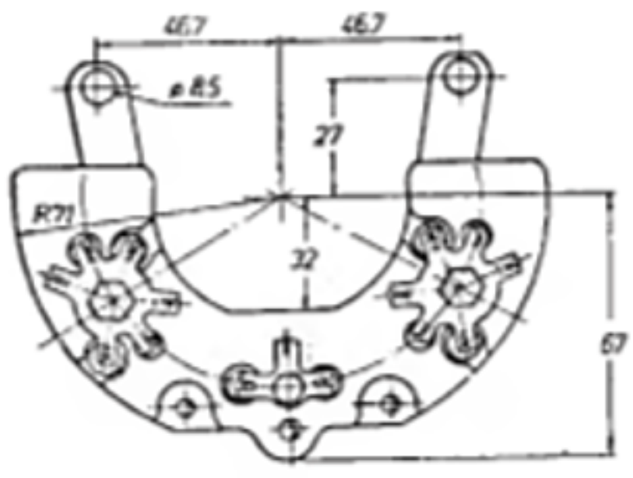
40PT 2



CASES : 45PT 2



60PT 2



100PT 2

TYPE	I_{d1} 6000rpm min. (A)	I_{d2} 3000rpm min. (A)	@ T_J (^oC)	V_{RRM} min. (V)	V_F @ max. (V)	I_F (A)	I_{RM} @ 25°C max. (mA)	T_{JM} max. (^oC)	CASE STYLE
4PT 2		4 *	80	200	1	4	1	175	4PT 2
4PTM 2		4.5*	80	200	1.2	4.5	0.05	80	4PTM 2
1C 1202	40	30	80	100	1.2	80	0.1	150	1C 1202
1C 1203	40	30	80	100	1.2	80	0.1	150	1C 1203
40PT 2	45	35	80	200	1.2	50	0.05	175	40PT 2
45PT 2	40 #	33 *	80	200	1.4	50	0.1	150	45PT 2
60PT 2	60	45	80	200	1.2	60	0.05	175	60PT 2
100PT 2	100	75	80	100	1.2	100	0.05	150	100PT 2

Notes: # I_{d1} @ 10,000 rpm
* I_{d2} @ 5,000 rpm

BANEASA S.A.

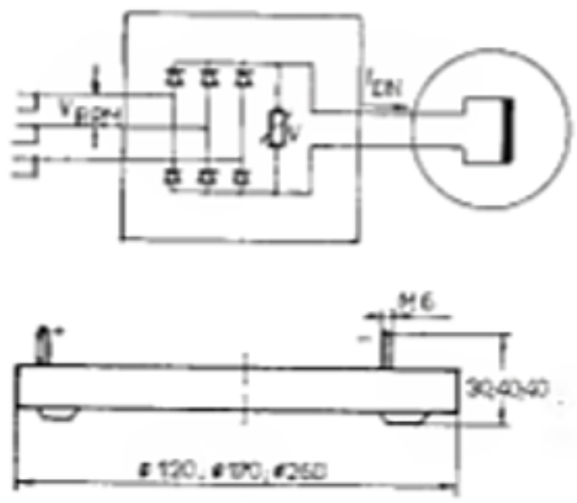
RECTIFIER BRIDGES, DIODE-DIODE

$ THREE-PHASE ROTATING SILICON RECTIFIER BRIDGES

I_{DN}=40-120A / T_C=85°C T_{jm}=150°C R_{thJ}=0.8°C/W/chip

TYPE	I_{DN} @ T_C (A)	(^oC)	V_{RRM} (V)	I_{FSM} 10ms (A)	I_r @ V_{RRM} & 25°C (mA)	150°C (mA)
PTR 40N 8	40	85	800	1600	0.1	3
PTR 40N 10			1000			
PTR 40N 12			1200			
PTR 80N 8	80		800			
PTR 80N 10			1000			
PTR 80N 12			1200			
PTR 120N 8	120		800			
PTR 120N 10			1000			
PTR 120N 12			1200			

CASE STYLE & CONNECTIONS



$ Preliminary data

DIODE-DIODE

TYPE	I_{FAVM} T_A=100°C (A)	V_{RRM} (V)	I_{FSM} (10ms) T_J=T_{JM} (A)	V_F @ max. (V)	I_F (A)	I_R @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)	CASE STYLE
115 A_{rms} T_{JM}= 150°C i^2t= 10.2kA^2s R_{thJ-C}= 0.58°C/W (per branch)								
MDD76N 200	76	200	1430	1.65	300	5	20	K-25
MDD76N 400		400						
MDD76N 600		600						(See next page)
MDD76N 800		800						
MDD76N 1000		1000						
MDD76N 1200		1200						
MDD76N 1400		1400						
MDD76N 1600		1600						
MDD76N 1800		1800						
130 A_{rms} T_{JM}= 150°C i^2t= 28.8kA^2s R_{thJ-C}= 0.45°C/W (per branch)								
MDD86N 200	86	200	2400	1.38	300	5	20	K-25
MDD86N 400		400						
MDD86N 600		600						(See next page)
MDD86N 800		800						
MDD86N 1000		1000						
MDD86N 1200		1200						
MDD86N 1400		1400						
MDD86N 1600		1600						
MDD86N 1800		1800						

RECTIFIER BRIDGES

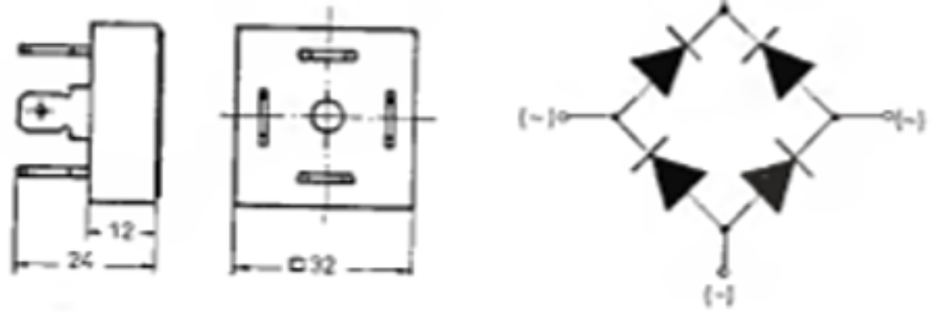
BANEASA S.A.

SINGLE-PHASE RECTIFIER BRIDGES

35A / T_C=85°C T_{jm}=150°C i^2t=800A^{2}s R_{thJ}=1.2°C/W/chip

TYPE	I_{dAV} @ T_C max. (A)	($^\circ$C)	V_{RRM} (V)	I_{FSM} (A)	I_r @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)
B 35N 200	35	85	200	500	0.05	2
B 35N 400			400			
B 35N 600			600			
B 35N 800			800			
B 35N 1000			1000			
B 35N 1200			1200			
B 35N 1400			1400			
B 35N 1600			1600			

CASE STYLE & CONNECTIONS

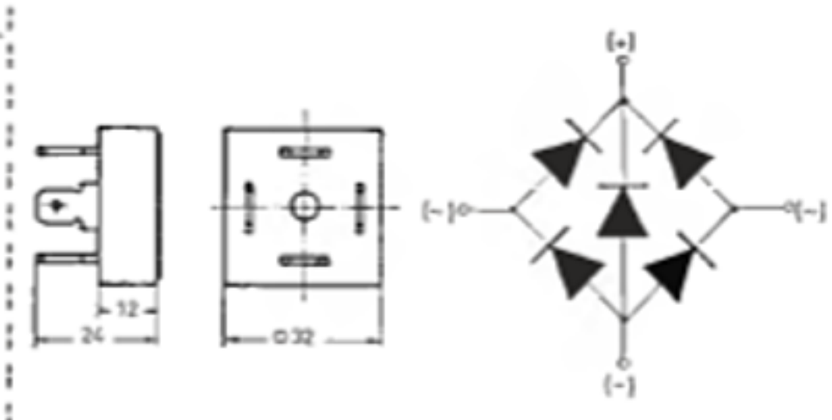


SINGLE-PHASE PROTECTED RECTIFIER BRIDGES

35A / T_C=85°C T_{jm}=150°C i^2t=800A^{2}s R_{thJ}=1.2°C/W/chip

TYPE	I_{dAV} @ T_C max. (A)	($^\circ$C)	V_{RRM} (V)	I_{FSM} 10ms (A)	I_r @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)	PROTECTION P_{RSM} (kW)	I_{FSM} (A)
BP 35N 400	35	85	400	500	0.05	2	10	100
BP 35N 600			600				6	
BP 35N 800			800				4	
BP 35N 1000			1000				2	

CASE STYLE & CONNECTIONS

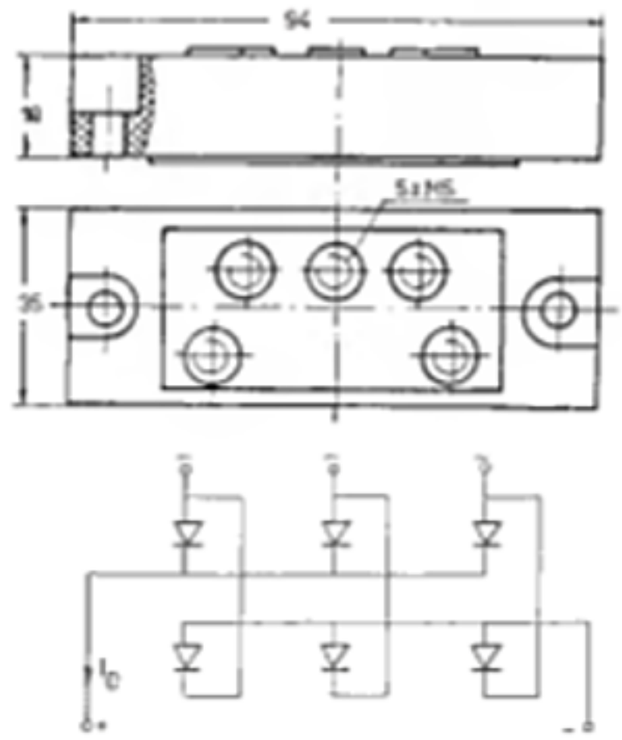


$ THREE-PHASE RECTIFIER BRIDGES WITH DIODES

85A / T_C=75°C T_{jm}=150°C i^2t=1200A^{2}s R_{thJ}=0.8°C/W/chip

TYPE	I_{dAV} @ T_C max. (A)	($^\circ$C)	V_{RRM} (V)	I_{FSM} (A)	I_r @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)
BTD 85N 400	85	75	400	750	0.1	3
BTD 85N 600			600			
BTD 85N 800			800			
BTD 85N 1000			1000			
BTD 85N 1200			1200			
BTD 85N 1400			1400			
BTD 85N 1600			1600			

CASE STYLE & CONNECTIONS



$ Preliminary data

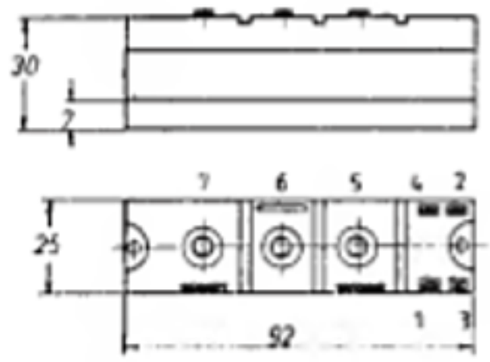
DIODE-DIODE

BANEASA S.A.

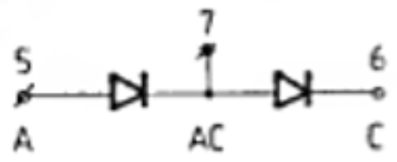
TYPE	I_{FAVM} T_A=100°C (A)	V_{RRM} (V)	I_{FSM} (10ms) $T_J=T_{JM}$ (kA)	V_F @ max. (V)	I_F (kA)	I_R @ V_{RRM} & 25°C max. (mA)	150°C max. (mA)	CASE STYLE
250 A_{rms} T_{JM}= 150°C i^2t= 231kA^2s R_{thJ-C}= 0.22°C/W (per branch)								
MDD165N 200	200	200	6.8	1.65	1	5	40	K-50
MDD165N 400		400						
MDD165N 600		600						
MDD165N 800		800						
MDD165N 1000		1000						
MDD165N 1100		1100						
MDD165N 1200		1200						
MDD165N 1400		1400						
MDD165N 1600		1600						
MDD165N 1800		1800						
350 A_{rms} T_{JM}= 150°C i^2t= 266kA^2s R_{thJ-C}= 0.17°C/W (per branch)								
MDD220N 200	250	200	7.3	1.55	1	5	40	K-50
MDD220N 400		400						
MDD220N 600		600						
MDD220N 800		800						
MDD220N 1000		1000						
MDD220N 1100		1100						
MDD220N 1200		1200						
MDD220N 1400		1400						
MDD220N 1600		1600						
MDD220N 1800		1800						

Case outlines and connections
(All dimensions in mm ; the heatsink is electrically isolated.)

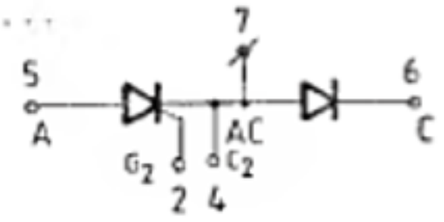
K-25



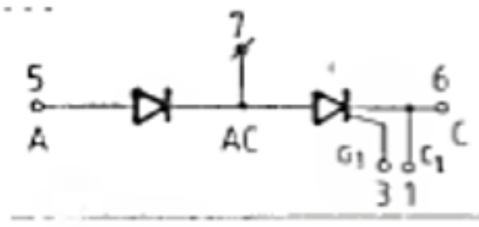
MDD ...



MDT ...



MTD ...



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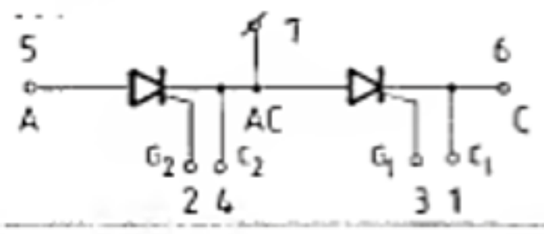
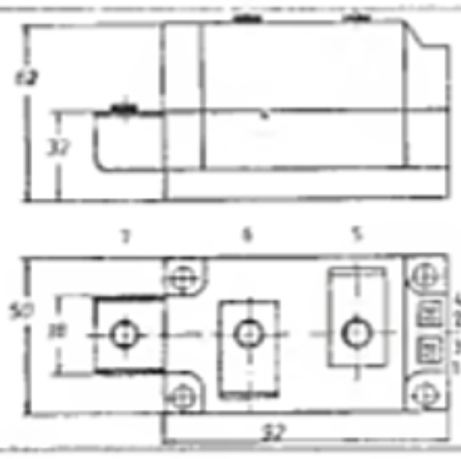


K-50



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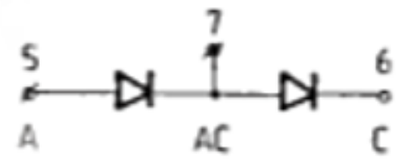

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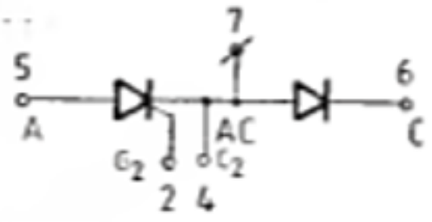

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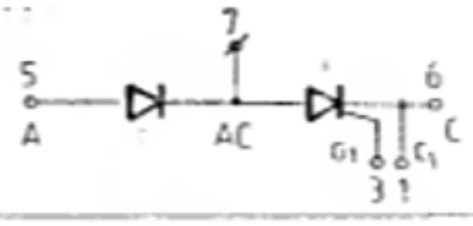

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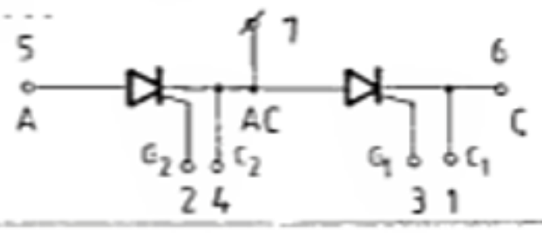


BANEASA S.A.

THYRISTOR-THYRISTOR

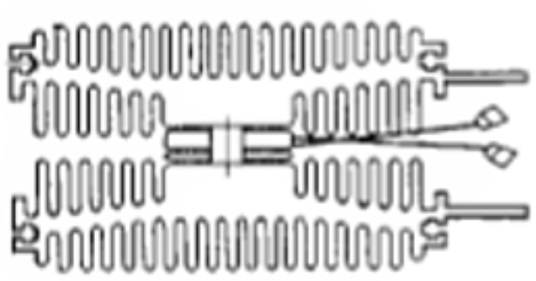
TYPE	I_{TAVM} (T_C=85°C) (A)	V_{RRM}= V_{DRM} (V)	I_{TSM} @ T_{JM} (A)	I_{RM}= I_{DM} @ T_{JM} (mA)	JUNCTION TEMPERATURE = 25°C: V_{GT} max. (V)	I_{GT} max. (mA)	I_H max. (mA)	V_{TM} @ I_{TM} (V)	(A)	dv/dt min. (V/us)	di/dt max. (A/us)	CASE STYLE
120 A_{rms} T_{JM}= 125°C i^2t= 12kA^2s t_q= 180us $R_{thJ-C}\leq$ 0.52°C/W (per branch)												
MTT60N 200	60	200	1550	20	1.4	120	200	2.15	300	50+	150	K-25
MTT60N 400		400										
MTT60N 600		600										
MTT60N 800		800										
MTT60N 900		900										
MTT60N 1000		1000										
MTT60N 1100		1100										
MTT60N 1200		1200										
MTT60N 1400		1400										
MTT60N 1600		1600										
MDT60N 200 -> 1600 diode-thyristor power blocks have the same thyristor characteristics.												
MTD60N 200 -> 1600 thyristor-diode power blocks have the same thyristor characteristics.												
150 A_{rms} T_{JM}= 125°C i^2t= 19kA^2s t_q= 180us $R_{thJ-C}\leq$ 0.39°C/W (per branch)												
MTT75N 200	75	200	1950	20	1.4	120	200	1.85	300	50+	150	K-25
MTT75N 400		400										
MTT75N 600		600										
MTT75N 800		800										
MTT75N 900		900										
MTT75N 1000		1000										
MTT75N 1100		1100										
MTT75N 1200		1200										
MTT75N 1400		1400										
MTT75N 1600		1600										
MDT75N 200 -> 1600 diode-thyristor power blocks have the same thyristor characteristics.												
MTD75N 200 -> 1600 thyristor-diode power blocks have the same thyristor characteristics.												
300 A_{rms} T_{JM}= 125°C i^2t= 135kA^2s t_q= 250us $R_{thJ-C}\leq$0.22°C/W (per branch)												
MTT170N 200	170	200	5200	80	2	200	300	1.98	1000	50+	150	K-50
MTT170N 400		400										
MTT170N 600		600										
MTT170N 800		800										
MTT170N 900		900										
MTT170N 1000		1000										
MTT170N 1100		1100										
MTT170N 1200		1200										
MTT170N 1400		1400										
MTT170N 1600		1600										
MDT170N 200 -> 1600 diode-thyristor power blocks have the same thyristor characteristics.												
MTD170N 200 -> 1600 thyristor-diode power blocks have the same thyristor characteristics.												
400 A_{rms} T_{JM}= 125°C i^2t= 190kA^2s t_q= 250us $R_{thJ-C}\leq$0.18°C/W (per branch)												
MTT210N 200	210	200	6200	80	2	200	300	1.7	1000	50+	150	K-50
MTT210N 400		400										
MTT210N 600		600										
MTT210N 800		800										
MTT210N 900		900										
MTT210N 1000		1000										
MTT210N 1100		1100										
MTT210N 1200		1200										
MTT210N 1400		1400										
MTT210N 1600		1600										
MDT210N 200 -> 1600 diode-thyristor power blocks have the same thyristor characteristics.												
MTD210N 200 -> 1600 thyristor-diode power blocks have the same thyristor characteristics.												

Notes: (*) Different dv/dt groups : B = 50 V/us ; C = 400 V/us ; F = 1000 V/us .

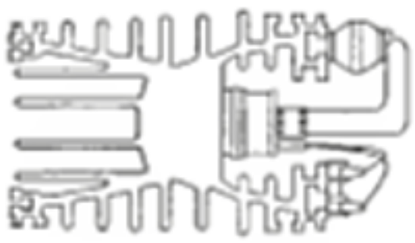
Test conditions : I_{RM} @ V_{RRM} ; I_{DM} @ V_{DRM} ; T_J = T_{JM} ; dv/dt @ 67% V_{DRM} & T_{JM}.

COOLED POWER DEVICES

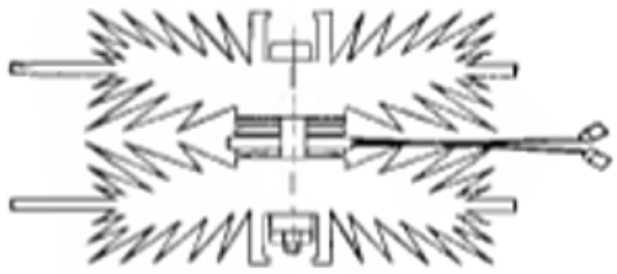
BANEASA S.A.



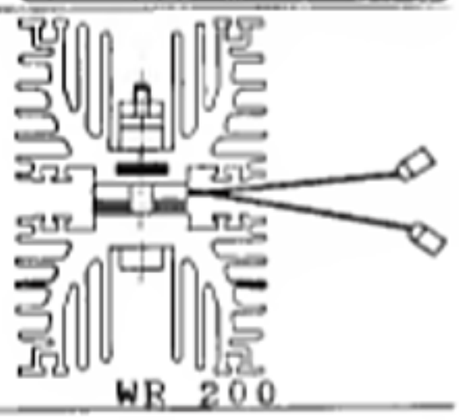
Kx 180



R 150

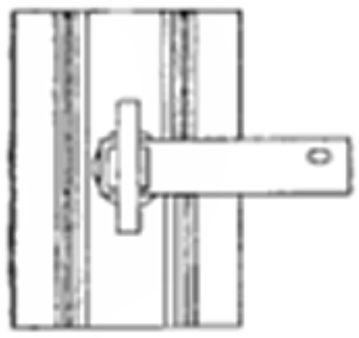


H 200

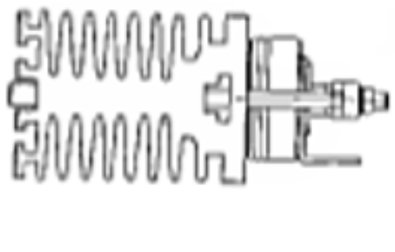


WR 200

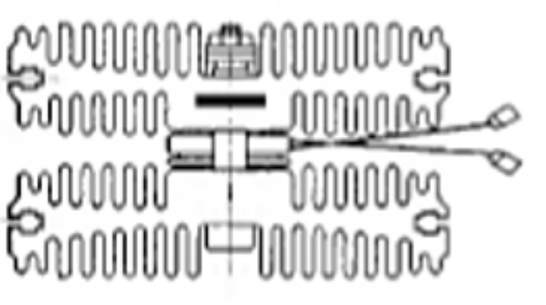
WS...-U-50



WS 150 , WS 350

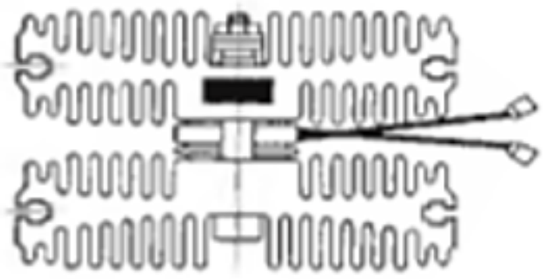


TVF

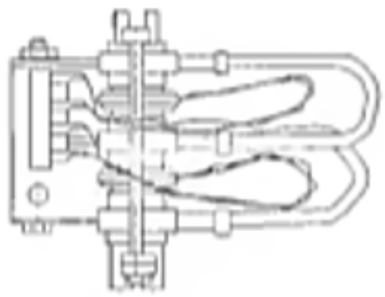


Kx1...-T

Kx1...-2xT50



Kx2



BAB

AIR COOLED DEVICES

TYPE	DEVICE CASE TYPE	R_{thC-H} typ. (°C/W)	R_{thC-A} Natural cooling (°C/W)	R_{thC-A} Forced cooling (°C/W)	F_{clamp} min. (kN)	F_{clamp} max. (kN)	V_{clamp} (system) (V)	DIMENSIONS max. (mm)	WEIGHT typ. (kg)
Kx 180 - T50	T-50	0.01	0.27	0.049	14	20	-	270x160x180	12.3
Kx 180 - T30	T-30	0.01	0.29	0.078	10	15	-	270x160x180	7.5
R 150 - E50	E-50	0.01	0.40	0.110	5	6	-	150x175x270	4.85
H 200 - T30	T-30	0.01	0.28	0.073	10	15	-	267x192x200	11.6
H 200 - E50	E-50	0.01	0.27	0.049	14	20	-	267x192x200	12.3
WR 200 - T30	T-30	0.01	0.237	0.086	10	15	-	222x176x200	8.0
WS 150 - U-50	U-50	0.01	0.455	-	14	20	-	240x156x150	5.7
WS 150 - T30	T-30	0.01	0.273	-	14	20	-	240x156x150	5.5
WS 350 - 2xT30	2xT-30	0.02	-	-	12	15	2500	240x156x350	10.5
WS 350 - T50	T-50	0.016	-	-	15	18	2500	240x156x350	10.5
WS 300 - U-50	U-50	0.01	0.325	-	14	20	-	340x156x300	10.0
TVF 180 - T30 - A	T-30	0.01	0.62	-		12	-	60x180x185	3.2
TVF 180 - 2xT30	2xT-30	0.01	0.62	-		12	-	60x180x211	3.2
TVF 300 - T30	T-30	0.01	0.58	-		12	-	80x300x185	7.05
TVF 600 - T30	T-30	0.01	0.55	-		12	-	80x600x185	14.01
TVF 180 - T30 - B	T-30	0.01	0.617	-		12	-	80x250x180	6.5
TVF 150 - E50	E-50	0.01	0.74	-		12	-	80x150x220	2.6
Kx1 - 137 - T30	T-30	0.01	0.38	-	10	15	-	160x210x137	7.0
Kx1 - 180 - T30	T-30	0.01	0.272	-	10	15	-	160x210x180	8.5
Kx1 - 275 - T30	T-30	0.01	0.21	-	10	15	-	160x210x275	13.0
Kx1 - 137 - T50	T-50	0.01	0.34	-	10	15	-	160x210x137	7.1
Kx1 -275-2x137-2xT50	2xT-50	0.01	0.34	-		2.4	-	160x210x275	14.0
Kx2 - 130 - T20	T-20	0.01	0.34	-		12	-	80x200x130	3.5
Kx2 - 130 - T30	T-30	0.01	0.55	-	10	15	-	80x200x130	4.0
Kx2 - 260 - T30,T20	T-20/30	0.01	0.34	-		12	-	80x200x260	7.5

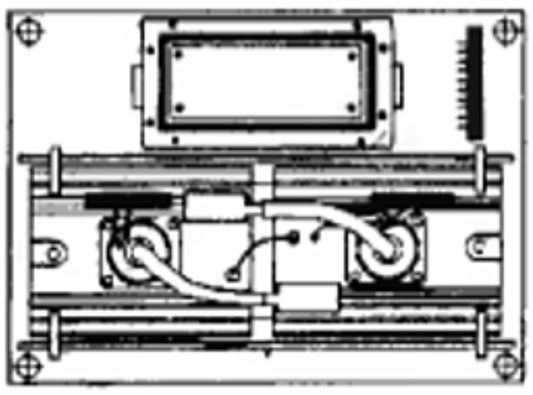
Notes: Operating temperature : -40 ... + 50 °C; R_{thC-H} @ P = 200 W
Storage temperature : -33 ... + 55 °C; R_{thC-H} @ P = 100 W for TVF 150-E50
Contact surface temperature : -40 ... +100 °C

WATER COOLED DEVICES

TYPE	DEVICE CASE TYPE	R_{thC-H} typ. (°C/W)	R_{thC-A} Natural cooling (°C/W)	R_{thC-A} Forced cooling (°C/W)	F_{clamp} min. (kN)	F_{clamp} max. (kN)	V_{clamp} (system) (V)	DIMENSIONS max. (mm)	WEIGHT typ. (kg)
BAB - 30	T-30	0.01		0.029	10	15		113x250x350	3.5
BAB - 50	T-50	0.01		0.024	14	20		140x250x350	4.0

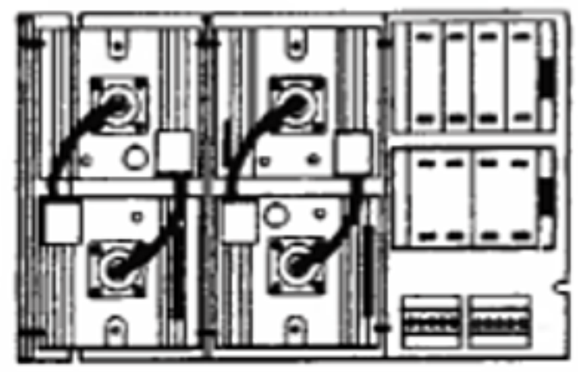
Notes: Cooling water temperature : +5 ... +35 °C
Contact surface temperature : +5 ... +80 °C

BANEASA S.A.

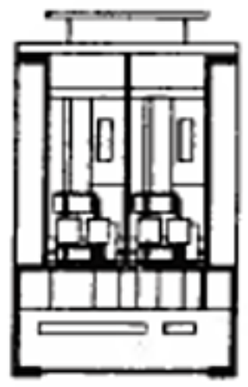


CSMA

CSTA 380V/63A...100A

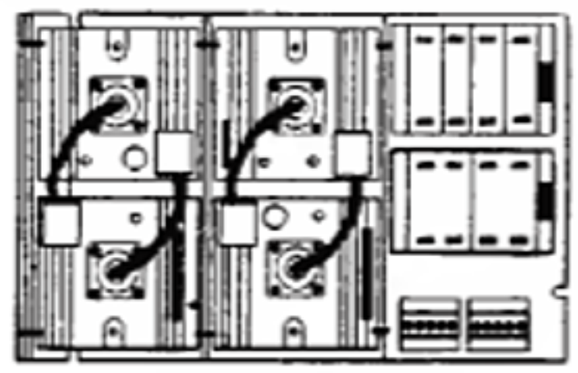


CSTA 380V/160A...320A



CST2

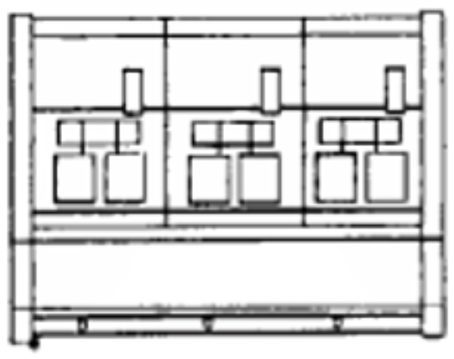
Preliminary data



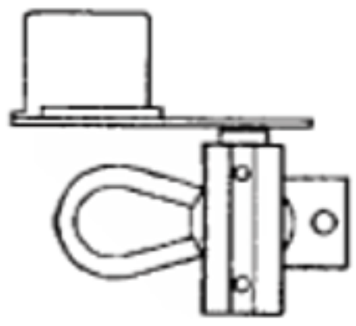
CST2-V

CSTP2

Preliminary data



CSTP2-V



CSTRF

CSA

TYPE (Includes : working voltage & nominal current)	DESCRIPTION	PROTECTIONS (see Note A)	COOLING	CONTROL SIGNAL SWITCH OFF ON	DIMENSIONS (mm)	WEIGHT (kg)
CSMA 220V(380V)/ 63A	SINGLE-PHASE CONTACTORS	1,2,3,4	Free air	0 +10V	286x260x180	12
CSMA 220V(380V)/ 80A CSMA 220V(380V)/100A						
CSMA 220V(380V)/160A CSMA 220V(380V)/200A CSMA 220V(380V)/250A CSMA 220V(380V)/320A		1,2,3,4	Free air	0 +10V	327x353x250	16
CSA 220V(380V)/1170A		1,2,3, ,6	Liquid (See Notes B,C,D)	0 +10V, 2/ 10mA, or 4/20mA	260x350x300	15
CSA 220V(380V)/1900A						17
CSTA 380V/ 63A CSTA 380V/ 80A CSTA 380V/100A	THREE-PHASE CONTACTORS	1,2,3,4,5,6	Free air	0 +10V	445x310x250	20
CSTA 380V/160A CSTA 380V/200A CSTA 380V/250A CSTA 380V/320A		1,2,3,4,5,6	Free air	0 +10V	630x335x250	30
CST2 380V/350A CST2 380V/400A CST2 380V/500A		1,2,3,4,5,6	Free air	0 +10V	380x650x350	42
$ CST2-V 380V/500A $ CST2-V 380V/630A $ CST2-V 380V/800A		1,2,3,4,5,6	Forced air	0 +10V	380x746x350	45
CSTP2 380V/160A CSTP2 380V/200A CSTP2 380V/250A CSTP2 380V/320A		1,2,3,4,5,6	Free air	0 +10V	380x650x350	42
$ CSTP2-V 380V/500A $ CSTP2-V 380V/630A $ CSTP2-V 380V/800A		1,2,3,4,5,6	Forced air	0 +10V	380x746x350	45
CSTRF 380V/400A	THREE-PHASE PULSE-TRAIN CONTROLLERS	1,2,3, ,6	Forced air	0 +10V, 2/ 10mA, or 4/20mA	350x550x540	70
CSTRF 380V/400A					350x650x540	76

$ Preliminary data

Notes : A. Protections : 1) Over-voltage; 2) du/dt; 3) thermal; 4) over-current; 5) phase/thyristor open; 6) short-circuit.

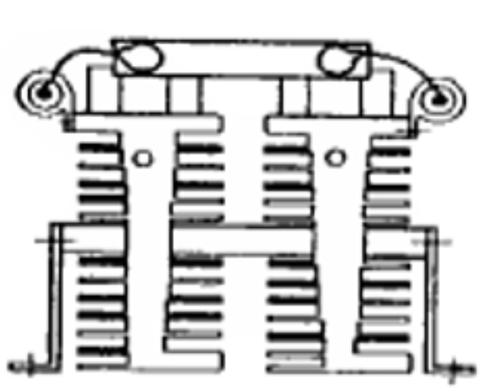
B. Operating temperature : -25 ... +40 °C.

C. Storage temperature : -33 ... +55 °C.

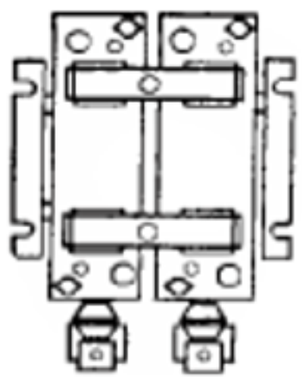
D. Cooling liquid temperature : + 5 ... +40 °C.

SINGLE-PHASE POWER BRIDGES

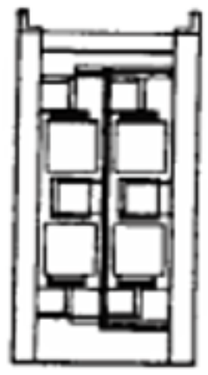
BANEASA S.A.



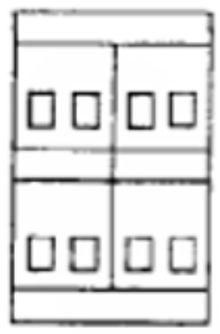
S-1



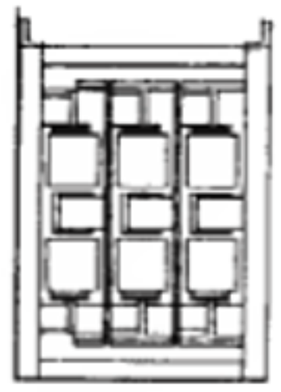
S-2



S-3



S-4



S-5

TYPE (Includes : working voltage & nominal current)	DESCRIPTION	PROTECTIONS (see Notes)	COOLING	DIMENSIONS (mm)	WEIGHT (kg)	ASSEMBLY TYPE
PM 220V/200A	Uncontrolled	1,2	Free air	190x200x210	6	S-1
PMB 380V/250A		1,2, ,6		216x370x250	17	S-2
PMB 380V/320A						
MPM-M 220V/320A		1,2,3, ,6		220x580x375	35	
MPM-M 220V/350A						S-3
MPM-M 660V/250A						
MPM-M 660V/350A						
MPM-MV 24V/1000A		1,2,3, ,6	Forced air	220x650x375	40	
MPM-MV 24V/1100A						
MPM-MV 220V/ 400A						
MPM-MV 220V/ 680A						S-3
MPM-MV 660V/ 520A						
MPM-MV 660V/ 630A						
MPM-MV 660V/ 850A						
MPM 660V/820A		1,2,3, ,6	Free air	415x780x350	60	
MPM 900V/650A						S-4
MPM 900V/700A						
PMS 220V/100A	Half controlled	1,2	Free air	190x200x210	6	S-1
PMSB 380V/100A		1,2, ,6		215x370x250	17	S-2
PMSB 380V/160A						
MPMS-M 220V/200A		1,2,3, ,6		220x580x375	35	
MPMS-M 220V/250A						S-5
MPMS-M 525V/160A						
MPMS-MV 220V/250A		1,2,3, ,6	Forced air	220x650x375	40	
MPMS-MV 220V/350A						S-5
MPMS-MV 220V/400A						
MPMS-MV 220V/680A						
MPMS 900V/400A		1,2,3, ,6	Free air	415x780x350	60	S-4
MPMS 900V/450A						
PMC 380V/100A	Full controlled	1,2	Free air	190x200x210	6	S-1
PMCB 380V/100A		1,2, ,6		215x370x250	17	S-2
PMCB 380V/160A						
MPMC-M 525V/160A		1,2,3, ,6		220x580x375	35	
MPMC-M 525V/200A						S-3
MPMC-M 660V/200A						
MPMC-M 660V/250A						
MPMC-MV 220V/350A		1,2,3, ,6	Forced air	220x650x375	40	
MPMC-MV 525V/250A						S-3
MPMC-MV 660V/520A						
MPMC-MV 660V/630A						
MPMC-MV 660V/680A						
MPMC 900V/400A		1,2,3, ,6	Free air	415x780x350	60	S-4
MPMC 900V/450A						
MPMCR-M 525V/160A	Reversible	1,2,3, ,6	Free air	220x850x375	65	
MPMCR-M 525V/200A						S-3
MPMCR-M 660V/200A						
MPMCR-M 660V/250A						
MPMCR-MV 220V/350A		1,2,3, ,6	Forced air	220x920x375	70	
MPMCR-MV 525V/250A						
MPMCR-MV 660V/520A						S-3
MPMCR-MV 660V/630A						
MPMCR-MV 660V/680A						
MPMCR 900V/400A		1,2,3, ,6	Free air	415x780x350	80	S-4
MPMCR 900V/450A						

Notes : A. Protections: 1) Over-voltage; 2) du/dt; 3) thermal; 4) over-current; 5) phase/tyristor open; 6) short-circuit.

B. Operating temperature: -25 ... +40 °C.

C. Storage temperature : -33 ... +55 °C.

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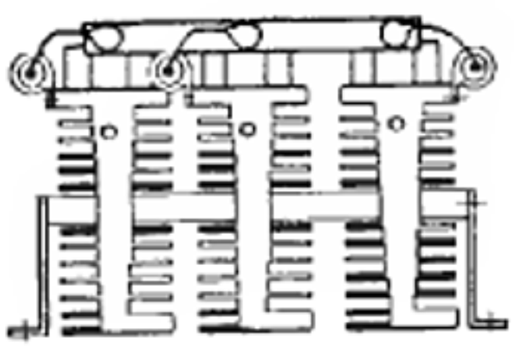
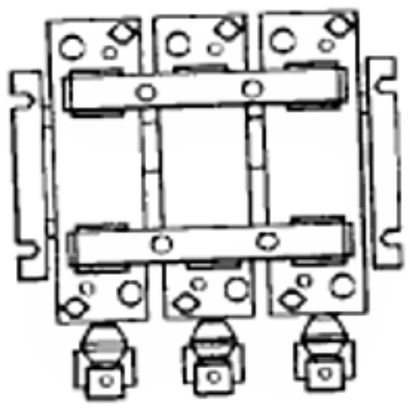
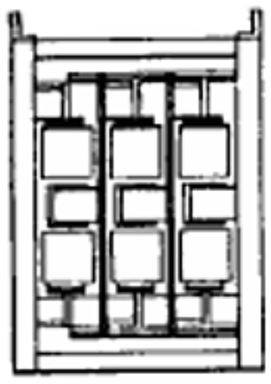
THREE-PHASE POWER BRIDGES



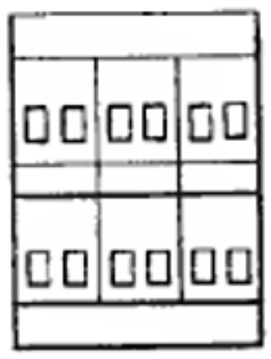
T-1



T-2



T-3



T-4

TYPE (Includes : working voltage & nominal current)	DESCRIPTION	PROTECTIONS (see Notes)	COOLING	DIMENSIONS (mm)	WEIGHT (kg)	ASSEMBLY TYPE
PT 220V/350A	Uncontrolled	1,2	Free air	280x200x220	9	T-1
PTB 380V/350A		1,2, ,6		290x370x250	25	T-2
PTB 380V/500A						
MPT-M 220V/400A		1,2,3		300x580x375	50	T-3
MPT-M 220V/500A						
MPT-M 660V/500A		1,2,3, ,6	Forced air	360x650x375	55	T-3
MPT-MV 24V/1350A						
MPT-MV 24V/1500A						
MPT-MV 220V/ 520A						
MPT-MV 220V/ 680A						
MPT-MV 220V/ 850A						
MPT-MV 660V/ 850A						
MPT-MV 660V/1050A		1,2,3, ,6	Free air	536x780x350	90	T-4
MPT 660V/1150A						
MPT 900V/ 900A						
MPT 900V/ 950A		1,2,3	Forced air	536x780x350	90	
MPT-V 48V/1900A						
MPT-V 48V/2050A						
MPT-V 48V/2700A						
MPT-V 48V/3500A				536x980x350	120	T-4
MPT-V 48V/4050A		1,2,3, ,6		536x780x350	90	
MPT-V 525V/1350A						
MPT-V 525V/1700A		1,2,3				
MPT-V 660V/2150A						
MPT-V 900V/1050A		1,2,3, ,6				
MPT-V 900V/1200A						
PTS 220V/160A	Half controlled	1,2	Free air	280x200x210	9	T-1
PTSB 380V/160A		1,2, ,6		290x370x250	25	T-2
PTSB 380V/250A						
MPTS-M 220V/250A		1,2,3, ,6		300x580x375	50	T-3
MPTS-M 220V/320A						
MPTS-M 525V/350A		1,2,3, ,6	Forced air	300x650x375	55	T-3
MPTS-MV 220V/320A						
MPTS-MV 220V/400A						
MPTS-MV 220V/680A		1,2,3, ,6	Free air	415x780x350	60	T-4
MPTS 525V/750A						
MPTS 900V/560A						
MPTS 900V/600A						
MPTS 900V/620A		1,2,3, ,6	Forced air	536x780x350	90	
MPTS-V 380V/1050A						
MPTS-V 525V/1350A						T-4
MPTS-V 525V/2000A						
MPTS-V 825V/ 850A						
MPTS-V 900V/ 680A						
MPTS-V 525V/1350A						

Notes :
A. Protections: 1) Over-voltage; 2) du/dt; 3) thermal; 4) over-current; 5) phase/tyristor open; 6) short-circuit.
B. Operating temperature: -25 ... +40 °C.
C. Storage temperature : -33 ... +55 °C.

THREE-PHASE POWER BRIDGES

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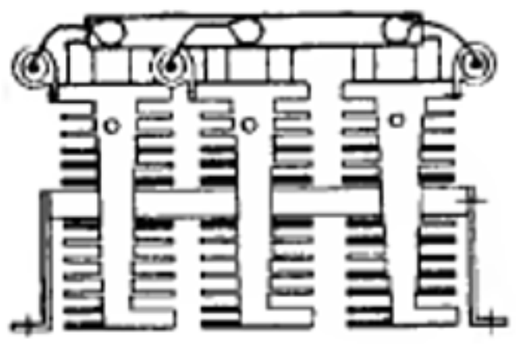
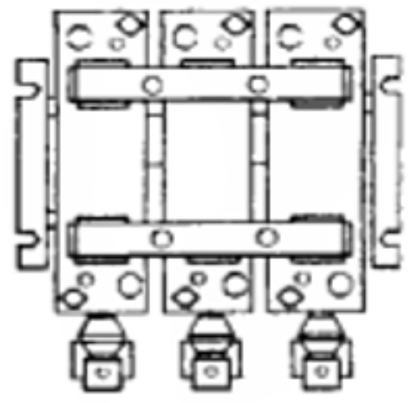
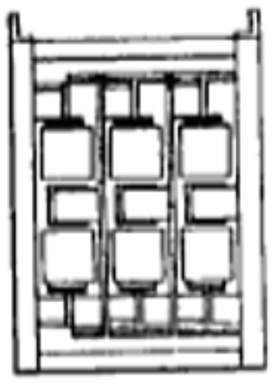


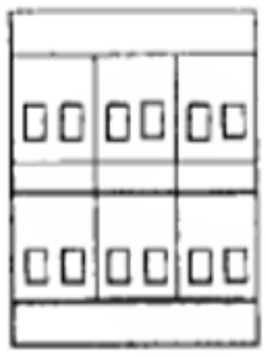
T-1



T-2



T-3



T-4

T-5

TYPE (Includes : working voltage & nominal current)	DESCRIPTION	PROTECTIONS (see Notes)	COOLING	DIMENSIONS (mm)	WEIGHT (kg)	ASSEMBLY TYPE
PTC 380V/160A	Full controlled	1,2	Free air	280x200x210	9	T-1
PTCB 380V/160A		1,2, ,6		295x370x250	25	
PTCB 380V/250A						T-2
MPTC-M 525V/250A		1,2,3, ,6		300x580x375	50	
MPTC-M 220V/320A						T-3
MPTC-M 660V/350A						
MPTC-MV 220V/400A		1,2,3, ,6	Forced air	300x650x375	55	
MPTC-MV 525V/320A						
MPTC-MV 660V/680A						T-3
MPTC-MV 660V/800A						
MPTC-MV 660V/850A						
MPTC-V 220V/1050A		1,2,3, ,6		536x780x350	90	
MPTC-V 380V/1050A						
MPTC-V 525V/1700A						
MPTC-V 525V/2000A						T-4
MPTC-V 825V/ 850A						
MPTC-V 825V/1350A						
MPTC-V 900V/ 680A						
MPTC-V 900V/1200A						
MPTCR-V 220V/1050A	Reversible	1,2,3, ,6	Forced air	536x780x350	90	
MPTCR-V 380V/1050A						
MPTCR-V 525V/1700A						
MPTCR-V 525V/2000A						T-4
MPTCR-V 825V/ 850A						
MPTCR-V 825V/1350A						
MPTCR-V 900V/ 680A						
MPTCR-V 900V/1200A						
MRT-LDE 900V/3000A, 110V/1500A		1,2,3, ,6		790x690x840	250	T-5
MRT-LDE 900V/4500A, 110V/1500A				1170x880x630	325	

Notes : A. Protections: 1) Over-voltage; 2) du/dt; 3) thermal; 4) over-current; 5) phase/tyristor open; 6) short-circuit.
B. Operating temperature: -25 ... +40 °C.
C. Storage temperature : -33 ... +55 °C.

BANEASA S.A.

CONTENTS

C O N S U M E R

A P P L I C A T I O N S

Audio Hobby _____ page 123

Light / Control _____ page 126

MUSICAL BELL

An economical CMOS IC generator producing a popular song. Needs external power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	6	8 V_{ac}
Supply current :	max.	200 mA
Melody period :		30 s
Dimensions :		100 x 60 mm

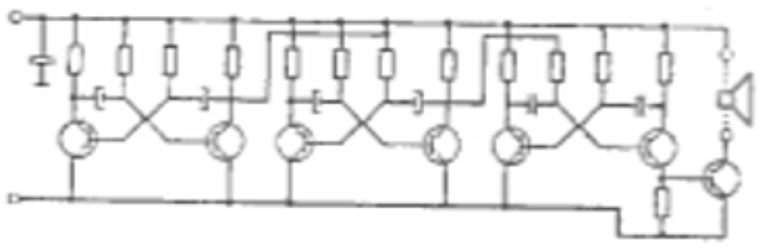
Preliminary data

ELECTRONIC PUPPY DOG

Faithfully reproduces the dog's barking. Requires external speaker and power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.5	9 V_{dc}
Supply current :	max.	200 mA
Speaker :	min. 0.5W / 3 ...	16 ohms
Dimensions :		100 x 30 mm

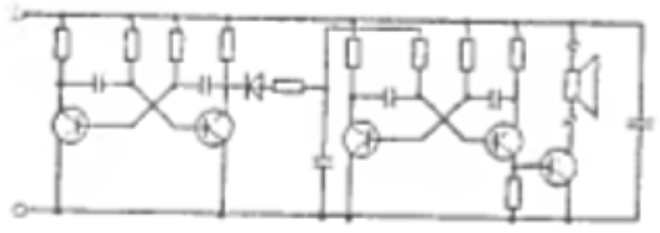


EMERGENCY SIREN

A sound generator for the emergency siren. Requires external speaker and power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	9 ...	12 V_{dc}
Supply current :	max.	200 mA
Speaker :	min. 0.5W / 3 ...	16 ohms
Dimensions :		50 x 60 mm

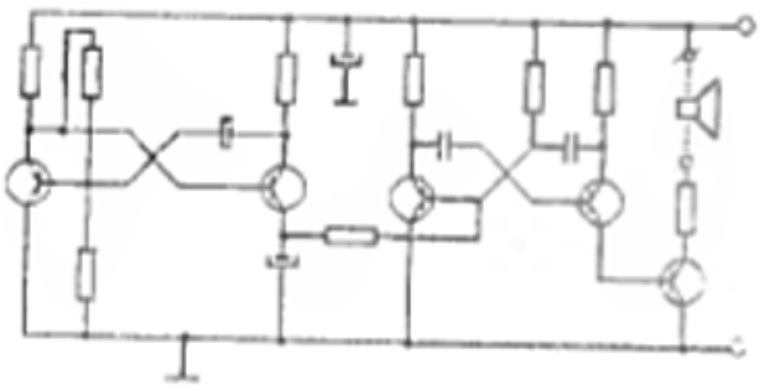


WAU-WAU SIREN

A sound generator imitating the police siren. Requires external speaker and power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.5	9 V_{dc}
Supply current :	max.	200 mA
Speaker :	min. 0.5W / 3 ...	16 ohms
Dimensions :		100 x 30 mm

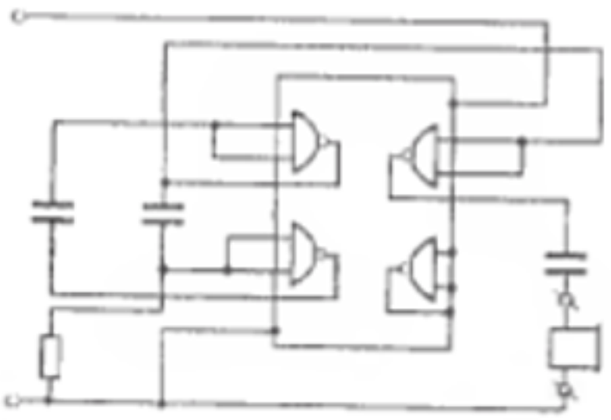


AUDIO FREQUENCY GENERATOR

A square waveform generator. Frequency range 800-1200 Hz. Requires external power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.8 ...	5.2 V_{dc}
Supply current :	max.	15 mA
Output impedance :		50 ohms
Dimensions :		50 x 60 mm

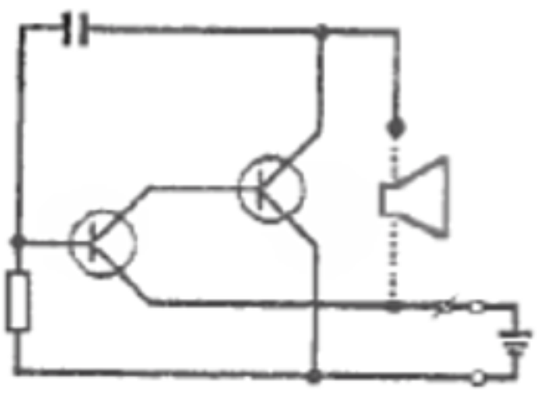


MORSE TRAINER

An useful circuit for learning Morse code. Requires external speaker and power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	3 ...	4.5 V_{dc}
Supply current :	max.	200 mA
Speaker :	min. 0.5W / 3 ...	16 ohms
Dimensions :		25 x 30 mm



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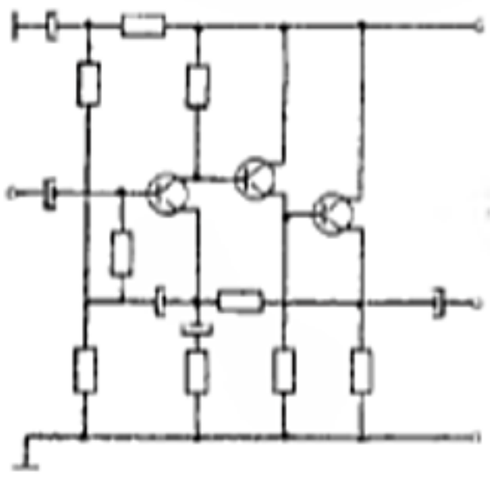
GENERAL-USE PREAMPLIFIER

A low cost transistor design. To be directly connected to the audio amplifier.

Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	18 ... 22	V_{dc}
Supply current :	max. 20	mA
Sensitivity :	50 mV / 470	ko
Dimensions :	100 x 30	mm

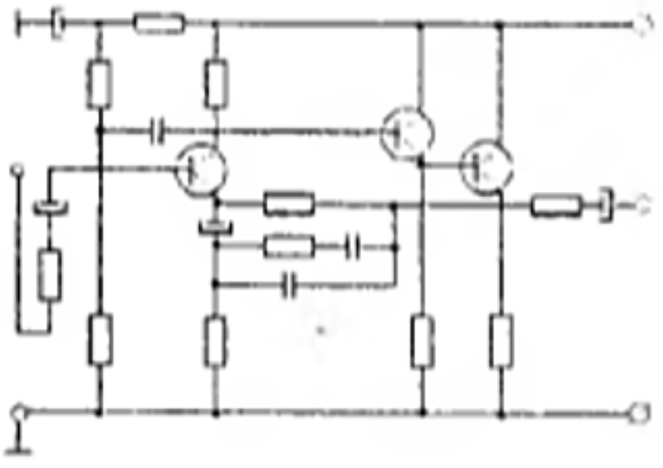


MICROPHONE PREAMPLIFIER

A low-frequency voice preamp. for microphone. To be connected to the tape/aux/tuner input.

Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	18 ... 22	V_{dc}
Supply current :	max. 10	mA
Input sensitivity :	2 mV / 40	ko
Dimensions :	100 x 30	mm

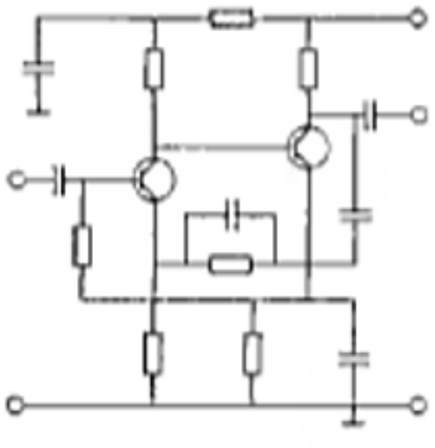


MICROPHONE AMPLIFIER

A low-noise microphone amp. To be connected to the tape/aux/tuner input of AF amplifiers.

Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	9 20	V_{dc}
Supply current :	max. 10	mA
Input voltage :	2 mV / 50	ko
Dimensions :	50 x 60	mm

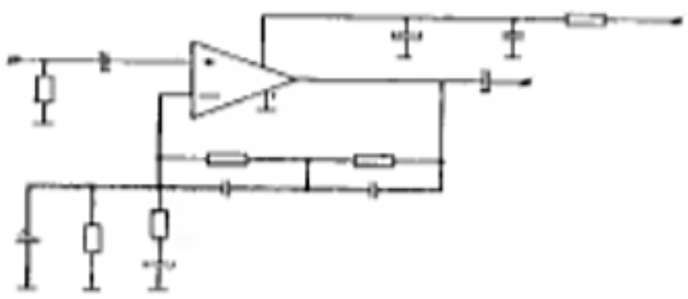


STEREO MICROPHONE PREAMPLIFIER

Low-noise stereo preamplifier based on the βM 387N IC. Needs external power supply.

Features :

Operating temperature :	0 ... +40	°C
Supply voltage :	15 ... 24	V_{dc}
Supply current :	max. 15	mA
Input sensitivity :	1 mV ... 160	mV
THD :	max. 0.4	%
Bandwidth (-3 dB) :	20 Hz... 20	kHz

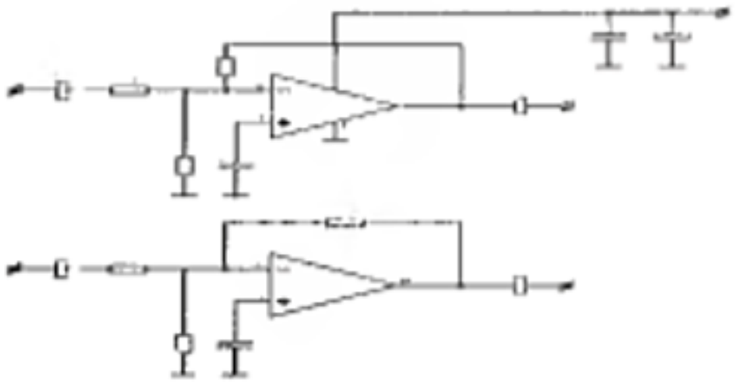


STEREO MOVING MAGNET HEAD PREAMPLIFIER

RIAA based low-noise, low THD stereo preamp. using the high-performance βM 387N IC.

Features :

Operating temperature :	0 ... +40	°C
Supply voltage :	15 ... 24	V_{dc}
Supply current :	max. 15	mA
Input sensitivity :	3 mV / 47	ko
THD :	max. 0.4	%

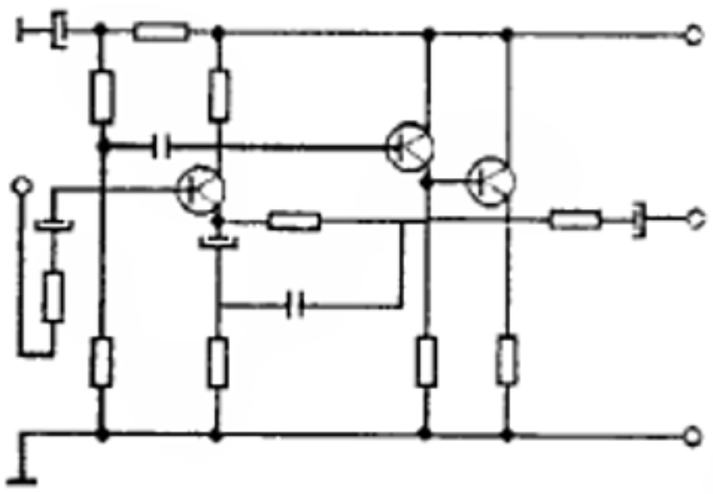


STEREO PREAMPLIFIER

A quality transistor preamplifier for the turn-table magnetic cartridge.

Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	18 ... 22	V_{dc}
Supply current :	max. 50	mA
Input sensitivity :	1 mV / 47	ko
Dimensions :	100 x 60	mm

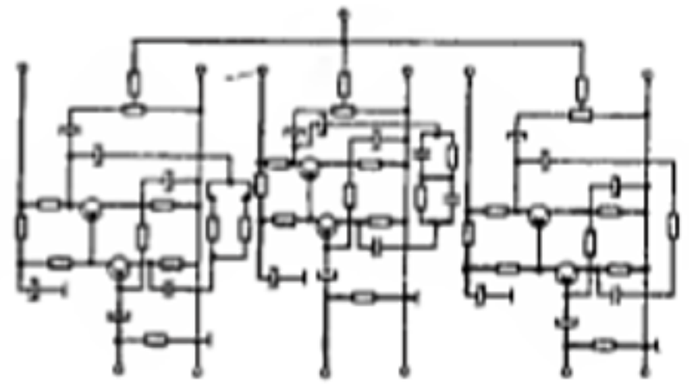


THREE CHANNEL AUDIO MIXER

A low-noise, 3 channel audio preamp. with a signal-mixer stage. Needs external supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	18 ...	22 V_{dc}
Supply current :	max.	20 mA
Output voltage :		60 mV
Dimensions :		100 x 60 mm

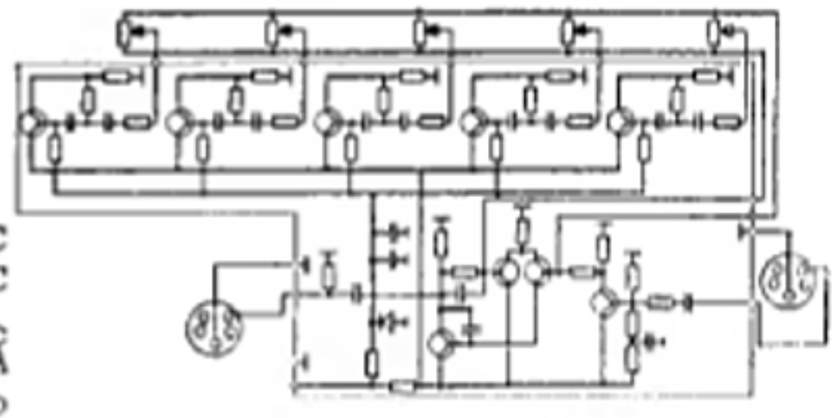


FIVE RANGE AUDIO EQUALIZER

A selective tone controller. Frequency poles are: 60Hz, 220Hz, 2.6kHz, 7kHz and 15kHz.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :		30 V_{dc}
Supply current :	max.	50 mA
Sensibility :	300 mV / 47 ko	
Dimensions :		100 x 60 mm

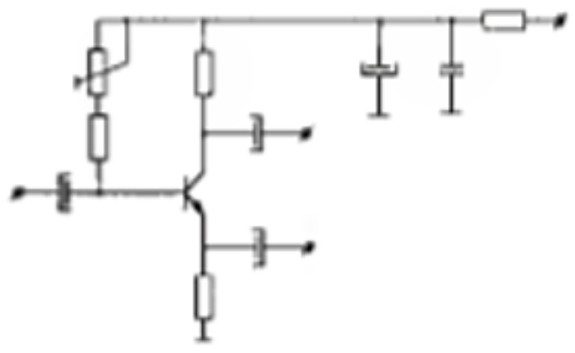


DEPHASOR DRIVER FOR BRIDGE POWER AMPLIFIERS

High performance, easy to use dephasor stage for driving bridge amplifiers.

Features :

Operating temperature :	0 ...	+40 °C
Supply voltage :	15 ...	24 V_{dc}
Input resistance :	typ.	500 ko
Audio input voltage :	max.	2 V_{ef}
Voltage gain (each output) :	typ.	1
THD :	max.	0.1 %

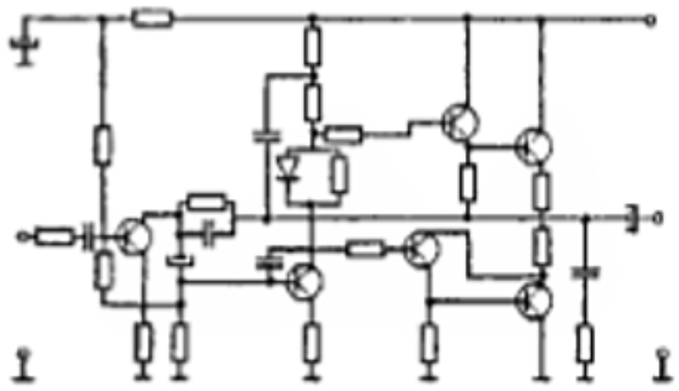


15 WATT AUDIO AMPLIFIER

A transistor-based, low-cost popular power amplifier. Requires external power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	30 V_{dc} ± 3 V_{dc}	
Input sensitivity :	0.7 V / 150 ko	
Dimensions :		100 x 60 mm

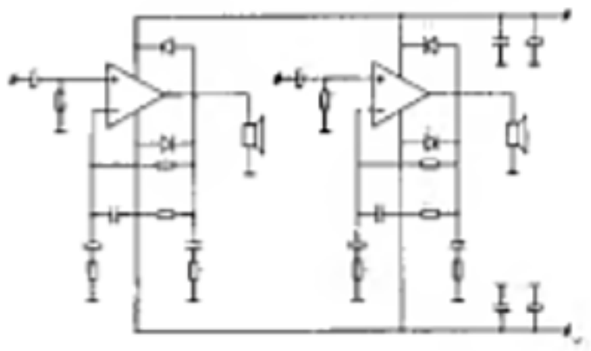


2x15W STEREO POWER AMPLIFIER

A compact, reliable, differential supply design based on the A 2030 IC.

Features :

Operating temperature :	0 ...	+40 °C
Supply voltage :	± 5 ...	±18V_{dc}
Load impedance :	4 ...	8ohm
Input voltage (P_{max}) :	max.	300 mV
Output RMS power (R_l= 8 / 4 ohms) :	9 /	15 W
Bandwidth (-3dB) :	20 Hz...	20kHz

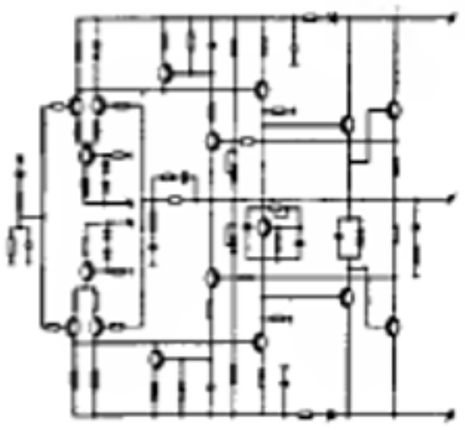


80W POWER AMPLIFIER MODULE

A wide-band, high slew-rate, low-distortion amp. with overload and shut-down protection.

Features :

Operating temperature :	0 ...	+40 °C
Supply voltage :	± 5 ...	±40V_{dc}
Load impedance :	4 ...	8 ohms
Output RMS power (R_l=8 ohms) :	typ.	80 W
THD :	max.	0.05 %
Slew-Rate :	min.	70V/us



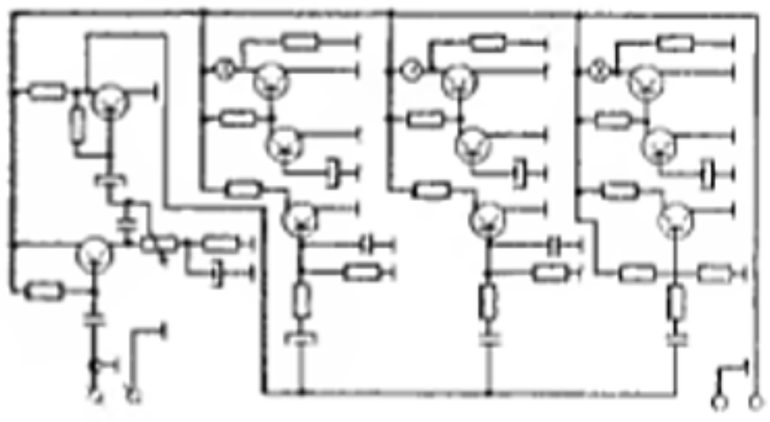
BANEASA S.A.

MINI LIGHT ORGAN

A low-cost, 3 channel disco light controller with low, mid and high frequency filters.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	9 ...	12 V_{dc}
Supply current :	max.	300 mA
Input impedance :		100 ko
Dimensions :		100 x 60 mm

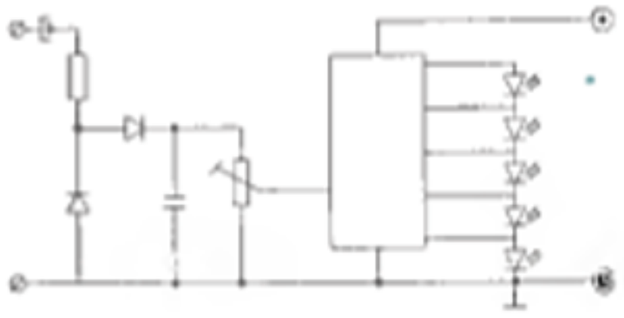


LED-BASED V.U. METER

An audio V.U. meter based on the βL 107 IC. To be mounted on the output of amplifiers.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	typ.	14 V
Supply current :	typ.	25mA
Input voltage :	min.	1.4 V_{ef}
Dimensions :		20 x 100 mm

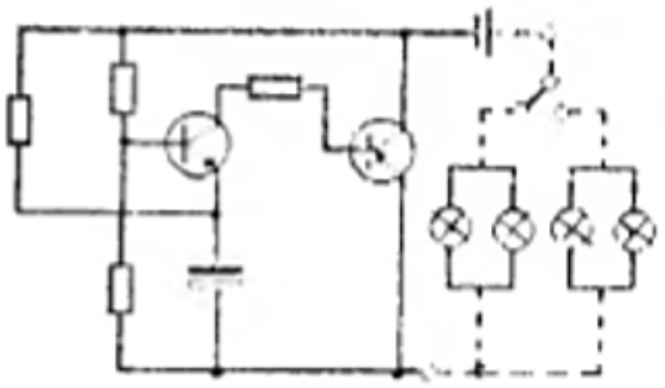


BI-DIRECTIONAL FLASHER

Transistor design for the bicycle direction indicator. Frequency rate: 0.8 ... 1.2 Hz.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	3 ...	4.5 V_{dc}
Supply current :	max.	300 mA
Lamp characteristics :	3 V and 250 mA	
Dimensions :		25 x 30 mm

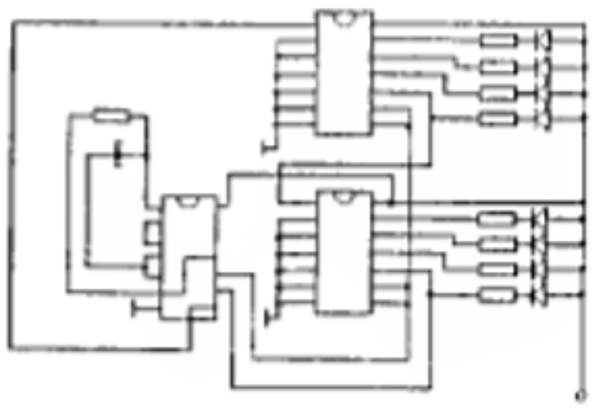


DYNAMIC LIGHT "LD1"

A simple IC design for LEDs driving. Requires an external power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.8 ...	5.2 V_{dc}
Supply current :	max.	100 mA
Flashing frequency :	5 ...	15 Hz
Dimensions :		50 x 60 mm

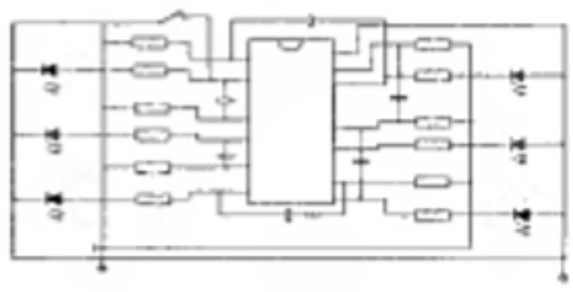


DYNAMIC LIGHT "LD2"

A TTL design for driving a 6-LED dynamic light. Needs external power supply.

Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.8 ...	5.2 V_{dc}
Supply current :	max.	200 mA
Dimensions :		50 x 60 mm

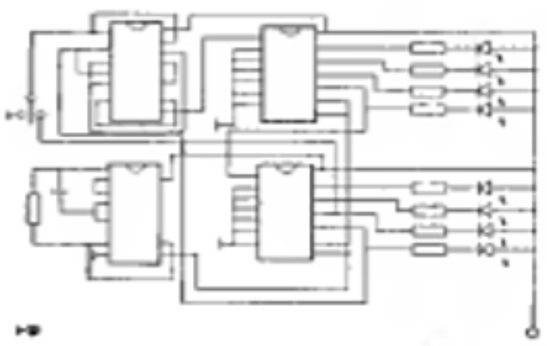


DYNAMIC LIGHT "LD3"

TTL design driving an 8-LED dynamic light. Switch for changing the light direction.

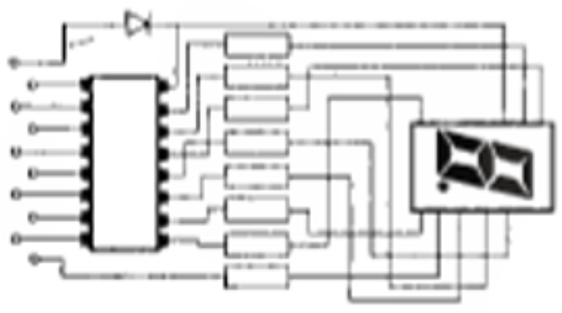
Features :

Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	4.8 ...	5.2 V_{dc}
Supply current :	max.	400 mA
Dimensions :		50 x 60 mm



PANEL METER WITH DISPLAY

A simple, easy to use TTL circuit, suitable for building display systems.

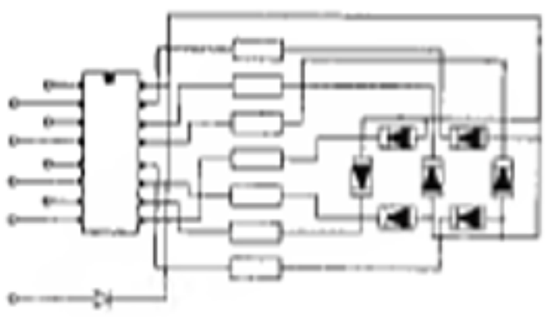


Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	4.8 ...5.2	V_{dc}
Supply current :	max. 100	mA
Dimensions :	25 x 60	mm

LED-BASED PANEL METER

A simple, easy to use TTL circuit, based on a BCD-to-decimal decoder.

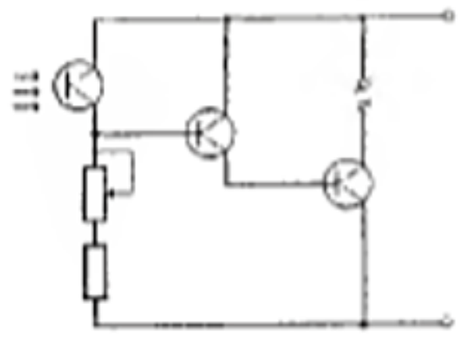


Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	4.8 ...5.2	V_{dc}
Supply current :	max. 200	mA
Dimensions :	25 x 60	mm

OPTICAL TRANSDUCER

Photo-transistor design to turn on a lamp when sensing light. Needs external supply.

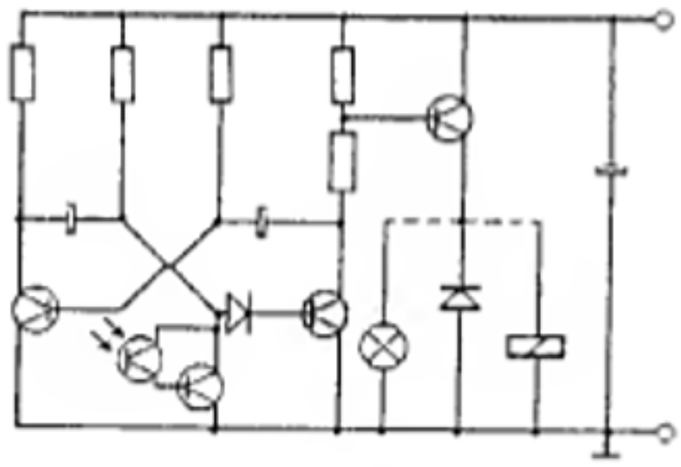


Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	4.5	V_{dc}
Supply current :	max. 200	mA
Sensitivity :	100	lx
Dimensions :	25 x 30	mm

AUTOMATIC LAMP FLASHER

An automatic warning flasher. Starts up when getting dark. Needs external power supply.

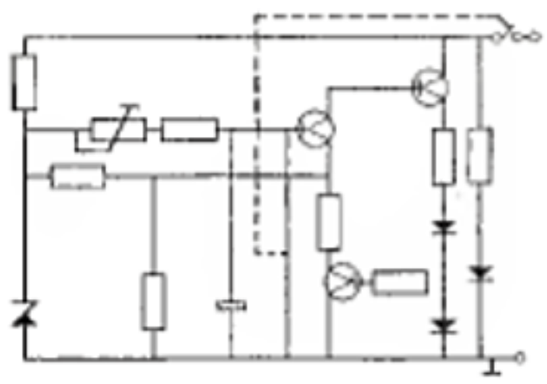


Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	3 ... 12	V_{dc}
Supply current :	max. 500	mA
Frequency :	0.1 2	Hz
Dimensions :	50 x 60	mm

TELEPHONE TIMER

A 3 units adjustment timer for the phone conversation. Needs external power supply.

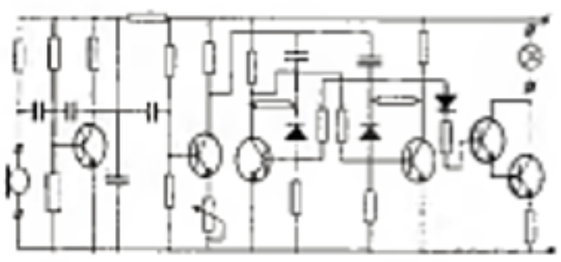


Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	6 ... 12	V_{dc}
Supply current :	max. 50	mA
Signaling source :		LED
Dimensions :	50 x 60	mm

SOUND-CONTROLLED ELECTRONIC SWITCH

Suitable for alarm systems, the circuit is an ON/OFF switch commanded by the voice sound.



Features :

Operating temperature :	0 ... +40	°C
Storage temperature :	-25 ... +40	°C
Supply voltage :	4.5 ... 12	V_{dc}
Supply current :	max. 500	mA
Dimensions :	30 x 100	mm

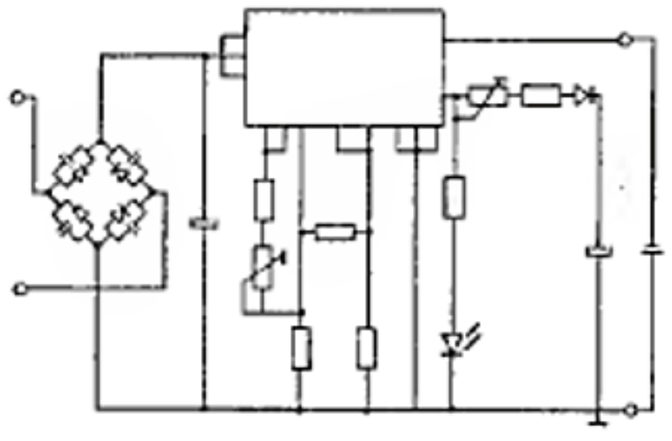
BANEASA S.A.

BATTERY RECHARGER

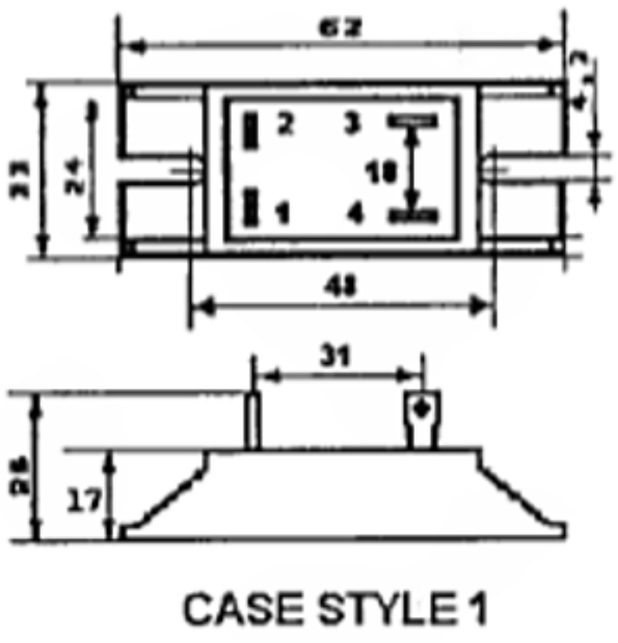
An IC design for Ni-Cd battery recharge.
Requires an external power supply.

Features :

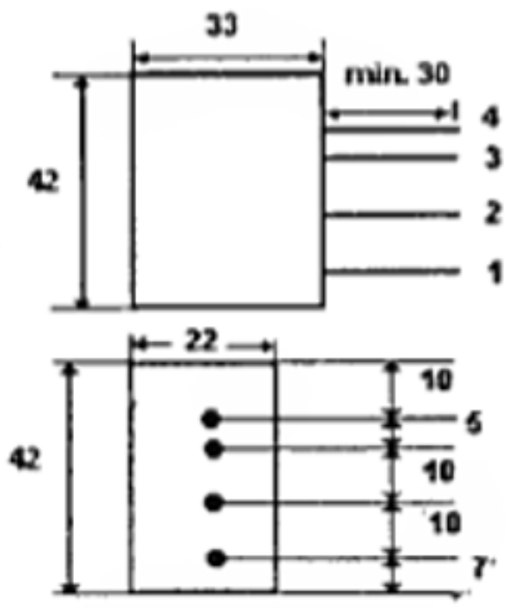
Operating temperature :	0 ...	+40 °C
Storage temperature :	-25 ...	+40 °C
Supply voltage :	10...15	$V_{ac/dc}$
Supply current :	max.	20 mA
Output voltage :	min.	1.3 V
Dimensions :		100 x 60 mm



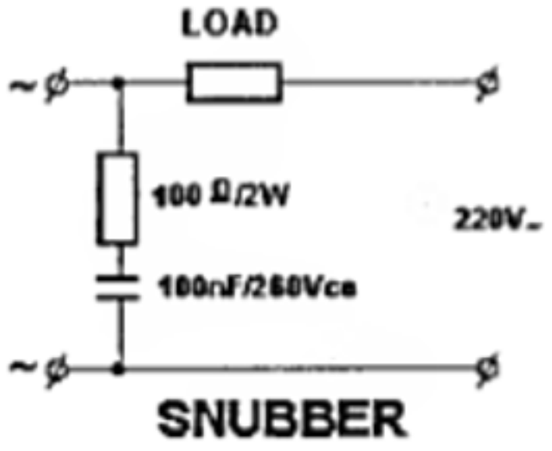
SPECIFICATIONS	TYPE				
	AC10A	AC6A	AC3B	DC2A	DC5A
In/Out	DC/AC	DC/AC	DC/AC	DC/DC	DC/DC
Case style	1	1	2	2	1
Terminal 1	in+	in+	out~	out+	out+
Terminal 2	in-	in-	out~	out-	out-
Terminal 3	out~	out~	in+	in+	in-
Terminal 4	out~	out~	in-	in-	in+
OUTPUT CIRCUIT					
Nominal line voltage	220V	220V	220V	24V	24V
Load voltage range	24-220V(a=90-176°)	24-220V(a=90-176°)	35-220V(a=90-176°)	4-60V	4-60V
Max Off State Leakage Current	15mA (220V,50Hz)	15mA (220V,50Hz)	15mA (220V,50Hz)	0.5mA (12V)	0.5mA (12V)
Load current range	100mA-10A Resistive load	100mA-6A Resistive load	100mA-3A Resistive load	1mA-2A	1mA-5A
Thermal resistance j-k	3.5°C/W	3.5°C/W	-	-	-
Turn-On time	10ms(50Hz)	10ms(50Hz)	10ms(50Hz)	75ns	
Turn-Off time	10ms(50Hz)	10ms(50Hz)	10ms(50Hz)	75ns	
Zero-voltage Switching	Yes	Yes	Yes	-	
In to Out insulation	Yes min.6Mohms min.2000Vmrs	Yes min.6Mohms min.2000Vmrs	Yes min.6Mohms min.1000Vmrs	Yes min.6Mohms min.500Vmrs	Yes min.6Mohms min.500Vmrs
Snubber	Not included	Not included	Included	-	-
INPUT CIRCUIT					
Control Voltage Range	3-25V	3-25V	2.3-12V	2.3-12V	2.3-12V
Control Current Range	2-5mA	2-5mA	1-30mA	1-30mA	1-30mA
GENERAL CHARACTERISTICS					
Operating temperature	-25..85°C	-25..85°C	-25..85°C	-25..85°C	-25..85°C
Storage temperature	-40..85°C	-40..85°C	-40..85°C	-40..85°C	-40..85°C
Potting high thermal conductive epoxy	Yes	Yes	Yes	Yes	Yes
Substrate	Ceramic	Ceramic	-	-	Metal-core
Torque	10Ncm(M4)	10Ncm(M4)	-	-	10Ncm(M4)
Weight	max 50g	max 50g	max 50g	max 50g	max 50g



CASE STYLE 1



CASE STYLE 2



SNUBBER

DISK SERIES

BANEASA S.A.

Used as overvoltage (surge) protection elements, the VD series of disk varistors prevent the damaging of the electrical and electronic equipment.

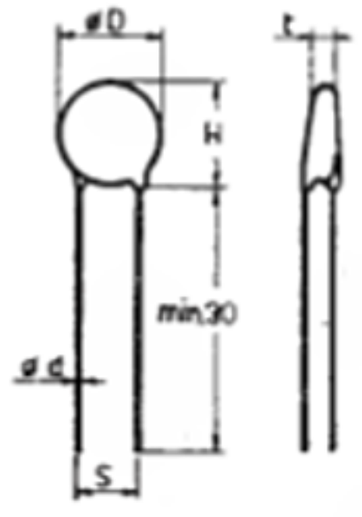
Dimensions

(Size : mm)

Type	D	H	d	t min.	t max.	S
VD ...K3	9	12	0.6	2	5	5
VD ...K4	12.5	16	0.8			7.5
VD ...K5	16.5	20	0.8			7.5
VD ...K6	22.5	26	1.0			10

Coding example:

	VD	250	K	4
Disk varistor				
Reference voltage				
Tolerance				
Type 3, 4, 5, 6				



Specifications

TYPE	Max. operating voltage V_{RMS} (V)	V_{DC} (V)	Varistor voltage V_v @ 1 mA (V)	Tolerance $\triangle v$ (%)	Permissible peak current I_{max}* (A)	i_{max}** (A)	Max. clamping voltage 8/20us V_{Cl} (V) @ I_{Cl} (A)		Typical capacitance f = 1 kHz (pF)
$ VD 130K3	130	170	206	± 10	300	6	340	10	200
$ VD 130K4	130	170	206	± 10	600	10	340	25	400
$ VD 130K5	130	170	206	± 10	1000	20	340	50	650
$ VD 130K6	130	170	206	± 10	2000	40	340	100	1340
$ VD 140K3	140	180	220	± 10	300	6	360	10	180
$ VD 140K4	140	180	220	± 10	600	10	360	25	370
$ VD 140K5	140	180	220	± 10	1000	20	360	50	610
$ VD 140K6	140	180	220	± 10	2000	40	360	100	1240
$ VD 150K3	150	200	240	± 10	300	5	396	10	170
$ VD 150K4	150	200	240	± 10	600	10	396	25	350
$ VD 150K5	150	200	240	± 10	1000	20	396	50	570
$ VD 150K6	150	200	240	± 10	2000	40	396	100	1160
$ VD 175K3	175	225	270	± 10	300	5	455	10	150
$ VD 175K4	175	225	270	± 10	600	10	455	25	300
$ VD 175K5	175	225	270	± 10	1000	20	455	50	490
$ VD 175K6	175	225	270	± 10	2000	40	455	100	1000
$ VD 230K3	230	300	360	± 10	300	5	596	10	115
$ VD 230K4	230	300	360	± 10	600	10	596	25	230
$ VD 230K5	230	300	360	± 10	1000	20	596	50	380
$ VD 230K6	230	300	360	± 10	2000	40	596	100	760
$ VD 250K3	250	320	390	± 10	300	5	650	10	106
$ VD 250K4	250	320	390	± 10	600	10	650	25	215
$ VD 250K5	250	320	390	± 10	1000	20	650	50	350
$ VD 250K6	250	320	390	± 10	2000	40	650	100	700
$ VD 275K3	275	350	430	± 10	300	5	710	10	96
$ VD 275K4	275	350	430	± 10	600	10	710	25	196
$ VD 275K5	275	350	430	± 10	1000	20	710	50	320
$ VD 275K6	275	350	430	± 10	2000	40	710	100	630
$ VD 300K3	300	385	470	± 10	300	5	775	10	90
$ VD 300K4	300	385	470	± 10	600	10	775	25	180
$ VD 300K5	300	385	470	± 10	1000	20	775	50	300
$ VD 300K6	300	385	470	± 10	2000	40	775	100	580
$ VD 385K3	385	506	620	± 10	300	5	1025	10	75
$ VD 385K4	385	506	620	± 10	600	9.5	1025	25	150
$ VD 385K5	385	506	620	± 10	1000	17	1025	50	240
$ VD 385K6	385	506	620	± 10	2000	35	1025	100	450
$ VD 420K3	420	560	680	± 10	300	5	1120	10	65
$ VD 420K4	420	560	680	± 10	600	9.5	1120	25	135
$ VD 420K5	420	560	680	± 10	1000	17	1120	50	220
$ VD 420K6	420	560	680	± 10	2000	35	1120	100	420
$ VD 460K4	460	615	750	± 10	600	9.5	1240	25	120
$ VD 460K5	460	615	750	± 10	1000	17	1240	50	200
$ VD 460K6	460	615	750	± 10	2000	35	1240	100	380
$ VD 510K4	510	670	820	± 10	600	9.5	1355	25	110
$ VD 510K5	510	670	820	± 10	1000	17	1355	50	180
$ VD 510K6	510	670	820	± 10	2000	35	1355	100	340
$ VD 550K4	550	745	910	± 10	600	9.5	1500	25	105
$ VD 550K5	550	745	910	± 10	1000	17	1500	50	170
$ VD 550K6	550	745	910	± 10	2000	35	1500	100	320
$ VD 625K4	625	825	1000	± 10	600	9.5	1650	25	90
$ VD 625K5	625	825	1000	± 10	1000	17	1650	50	150
$ VD 625K6	625	825	1000	± 10	2000	35	1650	100	280
$ VD 680K4	680	895	1100	± 10	600	9.5	1815	25	85
$ VD 680K5	680	895	1100	± 10	1000	17	1815	50	140
$ VD 680K6	680	895	1100	± 10	2000	35	1815	100	250

$ Preliminary data

* Ten pulses, 8/20 us, two per minute.

** Ten pulses, rectangular wave 2 ms, one every two minutes.

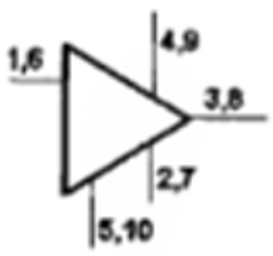
BANEASA S.A.

STEREO AMPLIFIER H 215

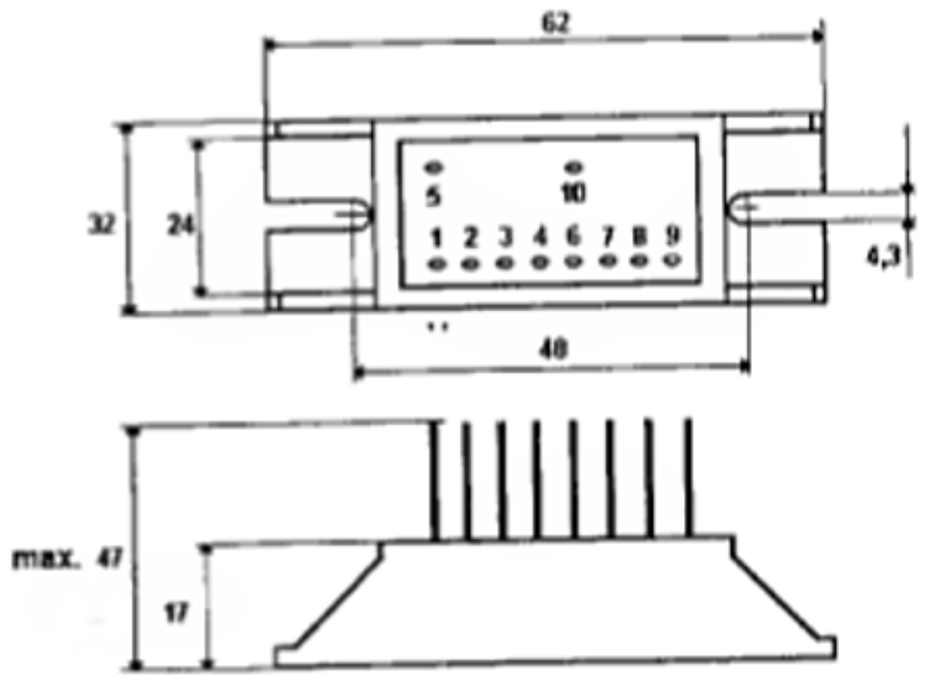
Stereo amplifier: 2x15W / 4 Ohms (2x9W / 8 Ohms); input voltage: 700mV

Pin significance

1- input left (L)
6- input right (R)
5- R reaction left
10- R reaction right
4- V+ supply left
9- V+ supply right
2- V- supply left
7- V- supply right
3- speaker left
8- speaker right



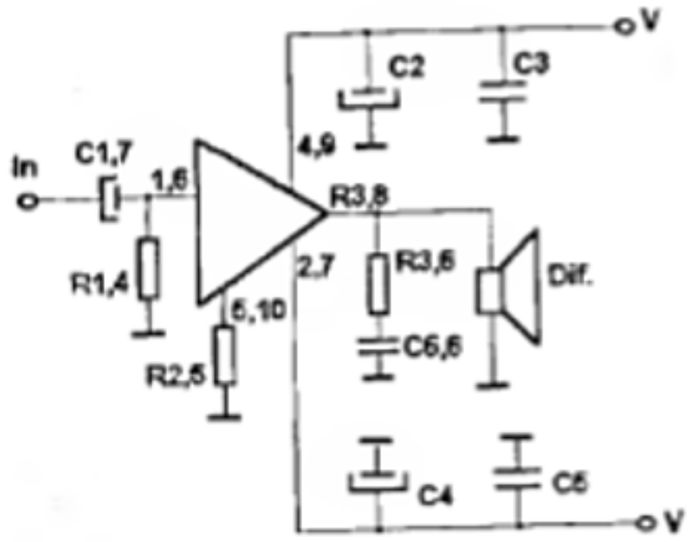
Case and dimensions

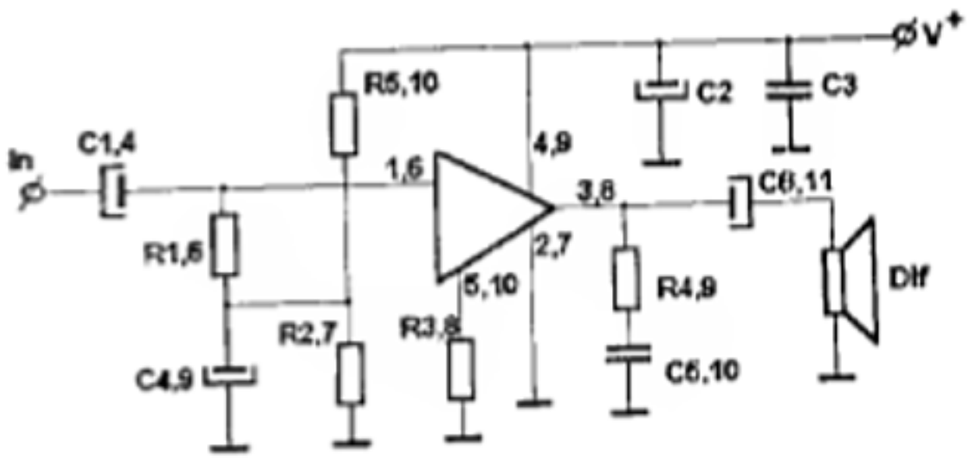


Distances [mm]

1-2:	5
2-3:	2.5
3-4:	2.5
4-6:	5
6-7:	5
7-8:	2.5
8-9:	2.5
1-5:	17.5
6-10:	17.5

Typical applications





AUTO IGNITION

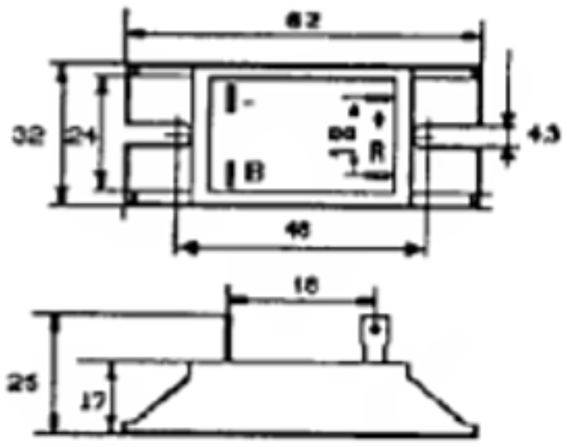
BANEASA S.A.

AUTO IGNITION

Features:

Supply voltage:	12V (10..15V)
Operating frequency range:	600..9000 rpm
Maximum supply current (medium value) .	2.5A
Platinum current:	max. 75mA
Minimum resistance of induction coil ..	2 Ohms

Switching to classical operation in case of malfunction.
Metal core substrate.



MICROCONTROLLER ASSISTED AUTO IGNITION SYSTEM

$-Preliminary data

1-COMMAND MODULE

-Based on an 8 bit microcontroller
-Mathematical estimation of the advance ignition angle, depending on engine turation, load and engine temperature, in order to optimize engine parameters

2-POWER MODULE

-Coil current charging angle (DWELL) control
-Coil current peak limitation
-Permanant conduction protection
-Overvoltage protection
-Minimum supply voltage 6V

SYSTEM FEATURES

-Easy cold-start
-Reduction of polution exhaust emissions
-Reduction of fuel consumption
-Increased engine performance (lean-burn, long time stability of parameters)

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ELECTRONIC COMPONENTS AND APPLICATIONS